Social Emotional Competence: Culturally-bound or Context-free?

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Abstract

Social emotional competence, or the intra- (e.g., emotion regulation) and interpersonal (e.g., conflict resolution) skills related to success, is currently seen as a panacea to low student achievement, the achievement gap, and school violence. Although it appears to be a promising approach to increasing academic, life, and work success, little research has examined whether social emotional skills are exhibited and valued similarly across cultures. This dissertation attempted to fill this gap in the literature by examining the potential for cultural bias in our current conceptualizations of "competence." Secondary data, collected from over 6,000 students in the Minneapolis Public School district (MPS), were analyzed to: (a) examine the interrelations between four social emotional skills (empathy, emotional control, critical thinking, and assertiveness); (b) determine whether students' skills were, in part, a function of their cultural background; (c) examine the relationship between these skills and educational success (i.e., academic achievement, behavioral issues); and (d) explore whether these relationships were invariant across cultures. Overall, this research found evidence suggesting that cultural background is related to social emotional competence. The intercorrelations among the four competencies varied in magnitude across genders, racial/ethnic groups, home language groups, and socioeconomic statuses. In addition, these four background/cultural variables were statistically significant predictors of social emotional competence, though effects were near zero for assertiveness and critical thinking, small for empathy, and small to moderate for emotional control. Analyses also found evidence that social emotional competence was predictive of student success, with the four competencies predicting different success outcomes. However, analyses supported overall invariance among these relations, for the pattern of relations between social emotional competence and

achievement was similar across cultures. Future research may further examine these complex relationships, identifying which competencies predict which success outcomes, and ensuring interventions and assessments are culturally relevant and equitable.

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Chapter One: Introduction

American public schools have seen an enduring pattern of low student achievement and achievement disparities over the last several decades. Over the past 25 years, efforts to bolster student achievement (e.g., No Child Left Behind) have primarily focused on academic and other cognitive strategies, such as developing more rigorous coursework, implementing common content standards (i.e., Common Core), and extending the school year. More recently, however, researchers and practitioners have begun to explore the promise of "non-academic" factors in increasing student achievement, focusing on social emotional competencies, or the intra- (e.g., emotion regulation) and interpersonal (e.g., conflict resolution) skills related to student success.

Interest in social emotional competence interventions and assessments has skyrocketed in recent years. Policymakers have proposed federal legislation mandating social emotional assessment for students, providing social emotional training for educators and other school staff, and increasing funding for social emotional research. Social emotional competence has also made its way into accountability discussions, with policymakers considering adopting social emotional competence standards as part of the Common Core (Kahn, 2013) and allowing schools to utilize measures of social emotional competence within their accountability systems (i.e., Every Student Succeeds Act; Blad, 2016). Several states have adopted or are currently developing social emotional standards for preK-12 education, requiring social emotional instruction and assessment much like we see for mathematics, reading, and science domains. Schools across the nation – and even around the world – have implemented school- or district-wide social emotional interventions, aiming to build students' social and emotional skills in hopes of producing

educational and life success (CASEL, 2017a, b). Despite this widespread excitement, however, experts in the field have expressed concern about current social emotional practices, questioning the use of social emotional measures in accountability systems, viewing social emotional efforts as a means to blame "deficient" students rather than troubled systems (e.g., Zernike, 2016), and feeling as though researchers and practitioners are simply "throwing stuff at the wall to see what sticks" (Caruso, as quoted in Kahn, 2013). These criticisms – paired with challenges translating abstract, empirical constructs to practical ideas – have proven to be a large obstacle for schools interested in implementing social emotional competence interventions and assessments.

This dissertation will study one such challenge with translating abstract theories to everyday practice: the application of social emotional competence models to culturally diverse students and schools. The remainder of Chapter One will describe the scope of social emotional competence interventions and assessments in public schools and education policy. It will then address limitations of the field, focusing on challenges associated with effectively translating research to practice. Finally, it will briefly describe the research problem addressed by this dissertation – our lacking understanding of the role of culture in social emotional competence – and will identify what impacts this limitation has on both social emotional research and practice.

Background of the Problem

Although the National Center for Education Statistics' (NCES) Indicators of School Crime and Safety Report (Zhang, Musu-Gillette, & Oudekerk, 2016) suggests school violence is on the decline, shocking cases like the Columbine High School and Sandy Hook Elementary School shootings have created great public concern over the

safety of American schools. Journalists, for example, have called school gun violence "both heartbreaking and disturbingly frequent," and have noted that we still know little about what inspires such violence (Jacobs, 2017). The public has also expressed increasing concern over low student achievement. After performing below average in mathematics – the US ranked 31 out of 35 industrialized countries – and near average on reading (ranking 20 of 35 industrialized countries) and science (ranking 19 of 35 industrialized countries) on the most recent Programme for International Student Assessment (PISA; OECD, 2016), policymakers, journalists, and other stakeholders expressed disappointment, confusion, and general concern. Peggy Carr, Acting Commissioner for NCES, suggested we "take a strong look at ourselves in mathematics" (Barshay, 2016), and then-Education Secretary John B. King Jr. acknowledged that the United States is "losing ground" (Kerr, 2016) and called the results "sobering news" (Mattimore, 2016). Meanwhile, journalists published article after article about our students' low performance (particularly in mathematics) and speculated why American schools were underperforming while other schools continued to make gains in achievement (e.g., Mattimore, 2016; Resmovits, 2016; Richmond, 2016; Star, 2016).

With increasing public concern came increased pressure on schools and policymakers to both ensure physically and emotionally safe school environments and remediate low student achievement. Though several efforts have attempted to address these concerns in a piecemeal way, stakeholders have advertised "social emotional learning" (i.e., social emotional competence interventions) as a means to address both challenges with one approach, for social emotional skills create environments conducive to student learning (e.g., build stronger relationships between educators and students) and

build important intrapersonal skills that facilitate student success (e.g., self-regulation, ability to persevere despite challenges). For instance, Scarlett Lewis, the mother of a student murdered in the Sandy Hook school shooting and the founder of the Jesse Lewis Choose Love Foundation, recently promoted the implementation of social emotional training in schools to prevent similar tragedies from happening in the future, and publicly stated that the shooting may never have happened if the shooter "understood the power of love" (Ryser, 2017).

Over the past twenty years, social emotional competence has steadily gained traction in American schools and policies. By 2015, over 500 evaluations of social emotional interventions were published (Weissberg, Durlak, Domitrovich, & Gullotta, 2015). In 2016, the Aspen Institute launched the National Commission on Social, Emotional, and Academic Development (see https://www.aspeninstitute.org/programs/national-commission-on-social-emotional-and-academic-development/), a partnership built across several sectors (e.g., education, business, health) to ensure high-quality implementation of social emotional competence interventions and standards in American schools. Social emotional competence is also represented in both federal and state education policies as well as in schools (in the form of interventions), across the country; this is described in greater detail in the section below.

Social Emotional Competence in Policy

State Policy. All 50 states have adopted social emotional competence standards for preschool education (CASEL, 2017b). In Minnesota, for example, social emotional competence is one of the eight domains in the early learning standards, the Early

Childhood Indicators of Progress. This domain is broken down into eight subcomponents, including confidence, self-awareness, emotions, managing thinking, managing emotions and behaviors, social responsiveness, building relationships, and social skills. Each of these subcomponents include developmentally-appropriate and measurable skills and abilities for five age groups in early childhood (0-1 year, 1-2 years, 2-3 years, 3-4 years, and 4-5 years/kindergarten readiness). At 0-1 year, for instance, an infant is expected to demonstrate social responsiveness by showing interest in or reacting to others' emotions and responding to others' emotional tone and actions. By 4-5 years, social responsiveness is evidenced by a child's ability to label complex emotions (e.g., pride), appropriately respond to others' emotions, and demonstrate perspective-taking abilities (Minnesota Department of Education, 2017). Although all 50 states do not utilize the same standards for preschool/early education, they have all implemented free-standing standards with a similar structure to those described above.

As of February 2017, four states – Illinois, Kansas, Pennsylvania, and West Virginia – adopted comprehensive, free-standing standards for K-12 education. Several other states have adopted comprehensive, free-standing standards but only through a certain grade level (e.g., Connecticut, through third grade), while other states have either adopted "non-comprehensive" standards for social emotional competence or provided formal resources to support social emotional training in schools (e.g., Tennessee; CASEL, 2017a). Through the Collaborating States Initiative (CSI), more states are currently in the process of developing K-12 social emotional standards, goals, and benchmarks (Blad, 2016; Dusenbury & Weissberg, 2017); this project is likely to further increase the popularity of social emotional competence in schools.

K-12 standards follow a similar structure to early childhood standards, with each state identifying different goals and/or benchmarks for competence. Illinois, one of the first states to develop social emotional standards (Baker, 2017), has identified three social emotional "goals" for K-12 students: (1) "develop self-awareness and self-management skills to achieve school and life success;" (2) "use social-awareness and interpersonal skills to establish and maintain positive relationships;" and (3) "demonstrate decision-making skills and responsible behaviors in personal, school, and community contexts." Each of these three goals is broken down into three or four learning standards, which are further broken down into developmentally-appropriate, measurable behaviors and abilities across five age groups (early elementary, late elementary, middle/junior high, early high school, and late high school). As part of goal one, for example, students must be able to identify and manage their emotions and behaviors (standard A). While this requires that an early elementary-age student exhibit impulse control and recognize and label emotions, late high school-age students must be able to evaluate how their emotional expression and positive attitudes impact others (Illinois State Board of Education, n.d.).

Federal Policy. Social emotional competence is also represented in federal legislation. The Every Student Succeeds Act (ESSA), signed into law in December 2015, has been interpreted as social emotional in nature, including language aligned with social emotional goals (e.g., recommendations for supporting safe and healthy students, encouraging schools to develop learning environments and student skills necessary for academic success; CASEL, n.d.; Ferguson, 2016) and requiring that states incorporate at least one "nonacademic" student-level indicator into their accountability systems (U.S.

Department of Education, n.d.). Though this Act does not specifically mandate the use of social emotional competence, school systems (e.g., CORE districts in California) are exploring the use of social emotional skills as their non-academic indicator, an approach questioned by many researchers in the field (Blad, 2016; Ferguson, 2016; Zernike, 2016).

In addition, three social emotional bills have been introduced to Congress: the Supporting Social and Emotional Learning Act (H.R. 497); the Academic, Social, and Emotional Learning Act of 2015 (H.R. 850); and the Jesse Lewis Empowering Educators Act (S. 897). The Supporting Social Emotional Learning Act was introduced in the House of Representatives on January 22, 2015. This act increases funding and resources for social emotional research, defines social emotional competence in alignment with CASEL's definition (see Chapter Two), provides resources (i.e., Teacher Quality Partnership grants) to train teachers and principals in using social emotional programs, and requires teacher training programs to teach social emotional competence ("H.R. 497 – Supporting Emotional Learning Act," n.d.). Both the Academic, Social, and Emotional Learning Act of 2015, introduced to the House of Representatives on February 10, 2015, and the Jesse Lewis Empowering Educators Act, introduced in the Senate on April 13, 2015, propose to amend the Elementary and Secondary Education Act (ESEA) to provide funding for teacher and principal training in social emotional competence through the Teacher and Principal Training and Recruiting Fund program ("H.R. 850 – Academic, Social," n.d.; "S. 897 – Jesse Lewis," n.d.). Interestingly, the Jesse Lewis Empowering Educators Act was named after a student who was murdered in the Sandy Hook school shooting, a clear statement of the perceived impacts of social emotional instruction on student behavior, mental health, and overall well-being.

Social Emotional Competence in Schools

Although social emotional competence is just making its way into policy, many school districts have been effectively implementing social emotional interventions in their communities for years. Perspectives Charter School in Chicago was developed to focus primarily on social emotional competence. Although only 8% of Perspectives students pass college readiness tests, 99% are accepted to college, 93% attend college, and 44% graduate college within 6 years, a percentage well above the city average (Felton, 2016). The Nashville Public schools were the first district in the state to hire a director of social emotional learning to train district staff on building students' social and emotional skills. Nashville is currently in the process of evaluating the impact of this position on student and staff outcomes, but teachers have described a noticeable impact in their schools (Tatter, 2014). In 2011, the Austin Independent School District (AISD) implemented a strategic plan for social emotional competence, developed by a social emotional learning design committee and a social emotional advisory committee. This plan involved several components, such as creating social emotional steering committees within each school; utilizing developmentally appropriate, evidence-based interventions and curricula; and providing professional development to teachers and principals (CASEL, 2015a). Cleveland Public Schools have also implemented social emotional competence throughout the district, utilizing a prescribed curriculum for elementary school and a more flexible, personal approach among high school students (e.g., infusing social emotional instruction in mathematics instruction). Interestingly, Cleveland adopted this approach after a 2007 school shooting in which a student shot two peers and two teachers before killing himself (Blad, 2015).

Social emotional competence has developed a strong presence our education system. By some estimates, tens of thousands of social emotional interventions are already in place in American schools (Kahn, 2013). From formal curricula to integrating social emotional skills with traditional academic domains, the above examples provide a sample of the various ways schools are utilizing social emotional techniques to produce student success and in some cases, measure school success. Despite the widespread excitement and interest in social emotional competence, however, the field has experienced several challenges, particularly when it comes to translating the high-level, abstract ideas from research to everyday instruction and application. This dissertation will study one particular challenge with translation: effectively implementing "one-size-fits-all" definitions and measures of competence within culturally diverse schools.

Statement of the Problem

Social emotional competence is a prominent focus of many American schools and classrooms, but as experts have suggested, the field appears to have gotten ahead of itself (e.g., Kahn, 2013). Though in theory, the concept of "social emotional competence" is exciting, intuitive, and undeniably important for student well-being and success, applications of competence advanced at a quicker rate than the very important foundational understandings. Said differently, social emotional competence was implemented in schools and policies were adopted before researchers could develop and articulate a clear understanding of not only what "competence" looks like, but how and why it relates to success.

This has resulted in several challenges associated with the translation of academic ideas to everyday practice. For example, researchers, policymakers, educators, and the

press have expressed concern over measures of social emotional competence, worrying about how social desirability, easily identifying the "right" answer, and the pressure of high-stakes testing impact students' results (e.g., Duckworth & Yeager, 2015; Whitehurst, 2016; Zernike, 2016). Critics have questioned the way social emotional competence has been implemented in schools, viewing it as a means to blame students for their social emotional "deficiencies" rather than holding accountable a broken system, excusing "uninspired teaching," or simply recreating the failed self-esteem movement (Zernicke, 2016). The field has also been criticized for its use of many terms to reflect the same construct (Kamenetz, 2015; Venator & Reeves, 2014), a challenge that often limits families' and practitioners' abilities to build skills across the many areas of a child's life (e.g., in school, in after-school programs, and at home).

One obstacle, however, poses a particular challenge for the implementation of social emotional interventions: our lack of knowledge regarding if and how the field's current understanding of "social emotional competence" applies to students of diverse cultural backgrounds. Although an extensive amount of research has examined the impact of social emotional interventions and programs, this literature is wrought with assumptions. Rather than acknowledging the subjectivity of many social emotional competencies, the field largely assumes these skills are universal, operating independently of cultural differences. If social emotional competence is not, in fact, a culturally universal set of skills and abilities, school-based interventions and other important applications of competence (i.e., policies, standards) may unintentionally discriminate against students in the minority culture, teaching these students that their understanding of themselves and others is "wrong." In turn, social emotional competence

may ultimately widen rather than reduce the achievement gap between White students and students of color, and may increase tensions between culturally diverse students and their schools, resulting in decreased overall well-being and success.

Research Questions

This dissertation aims to provide empirical evidence in support or refutation of a cultural approach to social emotional competence, in which students' cultural backgrounds impact their level of social emotional competence and/or the relations between social emotional competencies and important success outcomes. This study is guided by four research questions that lay the groundwork for examining and exploring cultural differences:

1. To what extent are social emotional skills (empathy, emotional control, critical thinking, assertiveness) related to one another?
2. On average, do students of different cultural groups (i.e., race/ethnicity, home language, income status, gender) score differently on measures of social emotional skills (empathy, emotional control, critical thinking, assertiveness)?
3. To what extent do social emotional skills (empathy, emotional control, critical thinking, assertiveness) predict student achievement, above and beyond traditional predictors of achievement?
    a. How are social emotional skills related to traditional predictors of academic success and achievement?
    b. Is the relationship between social emotional skills and student achievement invariant across cultural groups (i.e., race/ethnicity, home language, income status, gender)?

4. To what extent do social emotional skills (empathy, emotional control, critical thinking, assertiveness) predict student behavior, above and beyond traditional predictors of behavior?

Contributions of the Study

This research hopes to contribute to both research and practice. The Minnesota Department of Education is currently developing a set of social emotional standards for K-12 education which would require schools to teach and measure students' progress in social emotional competence. Furthermore, the Minneapolis Public School district (MPS) – our partner for this research project – has expressed great interest in implementing culturally relevant social emotional programs and measures in their schools (though these assessments will not be used for accountability purposes). Thus, this dissertation will contribute to MPS' efforts in this area, helping them identify whether the Holistic Student Assessment (HSA), the tool used in this study, proves useful for practice. Said differently, this dissertation will help MPS answer several important questions: Is the HSA measuring important skills, and do these skills predict important outcomes? Is there any evidence of cultural bias in the HSA? Overall, this work may help MPS identify what skills, outcomes, and areas of future research and evaluation are important to ensure equitable implementation of social emotional competence in their schools.

This dissertation also has important implications for the field. It fills a gap in the literature by exploring the role of students' cultural backgrounds in their level of social emotional competence and examining whether social emotional competence plays the same role in student outcomes for culturally diverse students as students in the majority culture. Because the field often utilizes randomized controlled trials or quasi-

experimental designs to examine the impact of social emotional interventions on student success, much of what we know about outcomes is tied to particular products. In addition, data in these studies are often aggregated at the school level (i.e., cluster-randomized designs) and participation in the intervention is the primary independent variable used to predict student success. This has created little knowledge regarding the relationship between competence and success at a student-level. In this study, we will examine the relationship between individual students' skill level and important student outcomes (i.e., achievement, behavior), thereby testing whether students' level of social emotional competence, independent of their participation in an intervention or program, is predictive of success.

Structure of the Dissertation

This dissertation is organized into five chapters. This chapter, Chapter One, has introduced the dissertation. It has briefly described the field of social emotional competence, focusing on current applications of competence in American schools and policies as well as limitations of this work. Chapter Two will provide a review of the literature, defining and summarizing conceptual models of social emotional competence and describing in greater detail the challenges of the field, particularly for culturally diverse students and schools. The remaining chapters will focus on this research study, with Chapter Three describing the study's methodology, Chapter Four summarizing the findings, and Chapter Five offering an interpretation of these findings and discussing potential implications for future social emotional research and practice.

Chapter Two: Review of the Literature

This chapter will open with a brief analysis of the development and progression of social emotional competence in American schools, beginning with Jane Addams and John Dewey in the late 1800's and early 1900's. Next, this chapter will review selected conceptual models of social emotional competence including the Clover Leaf Model, which was the guiding approach for this dissertation. Empirical research documenting the relationship between social emotional competencies and important educational outcomes will be summarized, followed by a discussion of limitations of current social emotional work. This chapter will conclude with a deeper discussion of one concerning limitation of the field: the role of culture in social emotional competence.

Historical Analysis

Social emotional competence has a long-standing history in the American educational system. John Dewey (1859-1952), a prominent psychologist and advocate for educational reform, and Jane Addams (1860-1935), the "mother" of social work, believed that schools should be a place for students to learn about responsible citizenship. Dewey's and Addams' teachings included the value of participating in a democracy as well as the importance of recognizing, understanding, and valuing human differences (Cohen, 2006; Osher et al., 2016). Although our current educational system aims to produce socially and emotionally competent graduates, the idea that these skills can be intentionally taught is just surfacing in schools and policies. This shift is likely due to the realization that academic instruction will not suffice in preparing students for life and work success (Weissberg et al., 2015) as well as increased concerns over violence and antisocial behavior in schools (Hoffman, 2009).

Social emotional competence was popularized by two psychological constructs: Emotional Intelligence (Goleman, 1995) and social emotional learning (SEL; Elias et al., 1997). Emotional Intelligence refers to one's intrapersonal skills, including the ability to self-motivate, delay gratification, persist through challenges and setbacks, and empathize with others. Goleman's 1995 book, *Emotional Intelligence: Why it can Matter More Than IQ,* made this psychological construct comprehensible and accessible to the public, providing personal anecdotes for readers and highlighting the importance and ease of teaching of intrapersonal skills.

The term "SEL" was proposed in 1994 and popularized in 1997 when Elias and colleagues – collaborators with the Collaborative for Academic, Social, and Emotional Learning (CASEL) – published *Promoting Social and Emotional Learning: Guidelines for Educators.* In this book, researchers coined the term "social emotional learning," referring to the processes by which we develop the skills, attitudes, and values central to social and emotional competence (e.g., self-management, social awareness). While CASEL's use of this term is constrained to conceptual frameworks that promote social, emotional, and academic competence through comprehensive, universal, and school-based interventions (Weissberg et al., 2015), it is now commonly used to describe almost any educational effort targeting students' social or emotional competence. In federal legislation, for example, social emotional competence, social emotional competencies, and social emotional interventions are referred to as "SEL," "SEL competencies," and "SEL programming," respectively.

CASEL (http://www.casel.org/), founded in 1994, aims to make social and emotional competence a central component of preK-12 education in the United States.

CASEL is currently leading the field of social emotional competence, and has developed a substantial presence in the literature and American educational system. Their approach to social emotional competence (described in more detail below) has been widely adopted in schools nationwide (Weissberg et al., 2015), and, since CASEL's founding, the mention of the phrase "social and emotional learning" has increased 19-fold in published books (Duckworth & Yeager, 2015).

The social emotional literature has grown immensely over the past 20 years, encompassing a variety of terms (e.g., character skills, noncognitive skills; Duckworth & Yeager, 2015), skills (e.g., persistence, responsible decision making, emotion regulation, relationship skills), and applications of social emotional competence. Despite this vast body of work, academics have yet to come to consensus in defining and operationalizing social emotional competence. These divergent understandings have resulted in a plethora of conceptual models of social emotional competence, each reflecting a slight variation from the next. Selected models will be reviewed below.

Conceptual Models of Social and Emotional Competence

There is no single widely accepted definition of or approach to social emotional research or practice. Instead, researchers and practitioners in the fields of developmental psychology, K-12 education, and higher education have developed several frameworks of social emotional competence, with each area utilizing the ideologies, paradigms, and goals of their field. For instance, models of competence in K-12 education focus largely on increasing student achievement and improving behavior (e.g., Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011; Osher et al., 2016); higher education is most interested in student admissions, retention, completion, and performance (e.g.,

Lotkowski, Robbins, & Noeth, 2004; Sedlacek, 2004); and developmental psychology (and psychopathology) aims to diagnose and remediate social emotional delays (e.g., Lipton & Nowicki, 2007; Malti & Noam, 2016). Divergent areas of focus and goals have resulted in many similar, yet somewhat distinct, definitions and models of what it means to be socially and emotionally "competent." Because the current study is focused on K-12 education, this chapter will review a selection of models within this area – including social emotional learning, noncognitive factors, 21st Century Competencies, Strive Together, and cooperative learning – as well as the guiding framework for the study, the Clover Leaf Model, which is informed by developmental psychology.

Social Emotional Learning

Social emotional learning (SEL), CASEL's approach to social emotional competence, is currently the most popular and widely-accepted model of competence. CASEL defines SEL as the processes by which we "acquire and effectively apply the knowledge, attitudes, and skills necessary to understand and manage emotions, set and achieve positive goals, feel and show empathy for others, establish and maintain positive relationships, and make responsible decisions" (CASEL, 2013, p. 4). In other words, SEL refers to the processes by which we develop social emotional competence, focusing on coordinated, universal, school-based interventions rather than more targeted, short-term interventions. Although most of CASEL's work has focused on K-12 students and educators, this model has been used in select early childhood and higher education programs as well (Hecht & Shin, 2015).

CASEL's model is composed of five social emotional competencies: self-awareness, self-management, social awareness, relationship skills, and responsible

decision making. *Self-awareness* refers to an understanding of one's emotions, personal goals, and values. This may include such tendencies as a positive mindset; a realistic sense of self-efficacy and optimism; and an understanding of the interrelationships between one's thoughts, feelings, and actions. *Self-management* requires the ability to regulate our emotions and behaviors, and includes skills such as delay of gratification, impulse control, perseverance, and stress management. *Social awareness* involves perspective taking, particularly with those of different backgrounds and cultures; empathy; and an understanding of social norms. *Relationship skills* refer to the skills required to establish and maintain healthy and supportive relationships, and may include one's tendency to act in accordance with social norms, communication skills, active listening, cooperation, conflict resolution skills, and the ability to resist inappropriate social pressures. Lastly, *responsible decision making* involves the knowledge, skills, and attitudes required for making responsible decisions about one's behavior and social interactions. This includes an understanding of ethics, recognition of safety concerns, the ability to accurately evaluate the consequences of an action, and the ability to take the health and well-being of others into account (Weissberg et al., 2015). CASEL's original model was composed solely of these five competencies; however, CASEL has recently adapted their model to include both student-level outcomes and the larger context in which SEL occurs. It should be noted that these additions reflect recent research findings, and theoretical justifications for these connections were applied post hoc.

CASEL posits that these five competencies are directly related to both short- and long-term attitudinal and behavioral outcomes. In the short-term, SEL has been found to result in improved social and emotional skills; positive attitudes toward the self, others,

and tasks; positive social behaviors and relationships; fewer conduct problems; reduced emotional distress, and increased academic performance. In the long-term, SEL has been related to increased rates of high school graduation; college and career readiness; healthy relationships; improved mental health; reduced criminal behavior; and engaged citizenship (Weissberg et al., 2015).

The SEL competencies and associated outcomes are situated within larger, contextual efforts, including local efforts, districtwide SEL practices, and state and federal policies and supports. Local efforts include classroom curriculum and instruction; school climate, policies, and practices; and family and community partnerships. Districtwide SEL practices may include the establishment of systems for measurement and continuous improvement; the establishment of classroom, schoolwide, and community SEL programming; and an assessment of SEL resources and needs. Finally, state and federal policies and supports refer to such policies as requiring educational standards for social emotional competence as well as those supporting SEL (e.g., increased funding for SEL research; Weissberg et al., 2015).

CASEL's approach to social emotional competence is supported by an expansive, thorough, and rigorous body of K-12 intervention research, including both quasi-experimental and randomized controlled trials (see CASEL, 2013, 2015b for a detailed breakdown of effective interventions). However, not all of this work was guided by the CASEL framework, with several interventions being categorized as aligning with CASEL's model ex post facto.

Although CASEL's research includes students of diverse backgrounds (i.e., low- and high-income, racial/ethnic diversity) and in diverse school settings (i.e., urban,

suburban, and rural schools; small, medium, and large schools), it is important to recognize that outcome data were rarely disaggregated by sociocultural characteristics (e.g., race/ethnicity, SES); instead, researchers tend to present the sociocultural characteristics of the entire school as opposed to study sample (Garner, Mahatmya, Brown, & Vesely, 2014).

Noncognitive Factors

Where SEL includes five domain-general social emotional competencies, the noncognitive factors model (Farrington et al., 2012) is situated within an academic context, and identifies five "noncognitive," or social emotional, predictors of academic success. This framework was developed from a comprehensive review and synthesis of the literature, and is one of the few conceptual models that hypothesizes *how* social emotional competencies produce increased academic achievement by coupling theory with empirical research.

The noncognitive factors model includes five categories of factors related to student achievement: academic behaviors, academic perseverance, academic mindsets, learning strategies, and social skills. *Academic behaviors* are behaviors that facilitate academic success, such as study habits and attending to and participating in classes. *Academic perseverance* is the tendency to remain focused and complete one's work in a timely manner despite challenges or failure; academic perseverance includes skills like grit, tenacity, delay of gratification, self-discipline, and self-control. *Academic mindsets* describe an individual's attitudes and beliefs about their academic abilities and performance, and include a sense of belonging, growth mindset, self-efficacy or positive mindset, and beliefs about the value of one's work, among others. *Learning strategies* are

those that facilitate student learning, such as study skills, metacognitive strategies, self-regulated learning, and goal setting. Lastly, *social skills* include interpersonal skills and behaviors that facilitate positive social interaction. This may include skills such as empathy, cooperation, responsibility, assertiveness, and social competence.

Most of these noncognitive factors are indirectly related to academic performance through academic behaviors; besides academic behaviors, learning strategies is the only other factor that is (theoretically) directly related to student performance. For instance, Farrington et al. (2012) posit that positive academic mindsets improve students' social skills, which improve academic performance through improved academic behaviors.

This model is embedded within the larger socio-cultural (i.e., structural mechanisms of schools and classrooms, subjective experience of people within schools) and school and classroom context. It is also embedded within student background characteristics (e.g., socioeconomic status, age, gender, and race/ethnicity), for it is hypothesized that these characteristics likely impact both noncognitive skills and academic performance.

Strive Together

The domain-specific approach to social emotional competence is not unique to Farrington and colleagues' (2012) noncognitive factors model. Strive Together, a national network dedicated to supporting the success of all children from cradle to career, has also taken this approach to social emotional competence, identifying a set of skills and abilities related to academic achievement (Strive Together, 2013a). This network, composed of 69 community partnerships within 32 states and Washington D.C., currently impacts over 8 million students nationwide, and hopes to improve core academic

outcomes across development, such as kindergarten readiness, high school graduation, and post-secondary enrollment (Strive Together, 2017).

Strive Together's (2013a) model of social emotional competence includes five malleable and measurable competencies: academic self-efficacy; growth mindset or mastery orientation; grit or perseverance; emotional competence; and self-regulated learning and study skills. *Academic self-efficacy* refers to students' belief in their ability to succeed on academic tasks such as geometry or writing. *Growth mindset or mastery orientation* includes beliefs or attitudes about learning that are tied to academic success. This may include beliefs about the malleability of intelligence, a sense of passion or purpose on academic endeavors, or a sense of identity and community in schools. *Grit or perseverance* involves the ability to remain focused on a goal or task despite failures, obstacles, or setbacks. *Emotional competence* refers to skills and abilities that promote prosocial behavior. This "emotional competence" construct is strikingly similar to CASEL's model of SEL, including such skills as emotion management, self-awareness, social awareness, and empathy, among others. Lastly, *self-regulated learning and study skills* require the ability to regulate one's emotional and behavioral response, and may include such skills as self-reflection, planning, self-control, and behavioral inhibition.

The Strive Together Network identified two additional competencies – critical thinking and creativity – as important for consideration, but did not include these constructs in the model. Critical thinking, defined as the process of analyzing and evaluating an issue to form a judgment, was not included because it is often considered to be a component of self-regulated learning. In addition, the relationship between critical thinking and academic achievement is not well established, for the majority of research

has focused on whether critical thinking is a teachable skill. Similarly, creativity was not included because: (1) creativity is difficult to measure, (2) research finds inconsistent relationships between creativity and academic achievement, and (3) given the current test-focused culture of our educational system, creativity is a difficult skill to foster in the classroom.

21st Century Competencies

Where the noncognitive factors and Strive Together models reflect a narrow approach to social emotional competence, the National Research Council's (2012) 21st century competencies model is characterized by a very broad conceptualization of competence. Within this model, the National Research Council (2012) defines "21st century competencies" as the knowledge that can be transferred or applied in new situations. Because this definition includes both content knowledge and other, related knowledge (e.g., social awareness), the 21st century competencies model is reflective of more than social emotional competence, including cognitive, intrapersonal, and interpersonal skills important for education, career, and life success.

The 21st century competencies model includes three broad domains of skills (cognitive, intrapersonal, and interpersonal), each composed of two or three "clusters" of competencies. The *cognitive* domain involves thinking and other related abilities (e.g., memory, reasoning), and is composed of three clusters of competencies: *cognitive processes and strategies*, *knowledge*, and *creativity*. The *intrapersonal* domain includes emotions and other skills related to the self (e.g., self-evaluation, self-monitoring, and adaptability) and is composed of three clusters: *positive core self-evaluation, intellectual openness*, and *work ethic and conscientiousness*. Finally, the *interpersonal* domain refers

to the skills and abilities required to interact effectively with others (e.g., conflict resolution, communication); this domain is composed of two clusters: *teamwork and collaboration* and *leadership*. Although this model provides an effective mode of organization for social, emotional, and cognitive skills, it is quite different than the models described above, and is unlikely to directly inform practice.

Cooperative Learning

Cooperative learning is based on social interdependence theory, which argues that within a given setting, individuals' goal structures determine how they interact with one another, which, in turn, determines the outcomes of that situation. In this sense, goal structures refer to one of two types of interdependence: positive (cooperative) or negative (competitive). Positive interdependence, or cooperation, encourages individuals to promote one another's success in meeting a shared goal, whereas negative interdependence, or competition, causes individuals to obstruct one another's efforts to meet a shared goal (Johnson & Johnson, 2005). Thus, social interdependence theory posits that when structured appropriately, cooperative activities will result in higher achievement and more positive social and psychological outcomes than will competitive or individualistic tasks.

There are five key elements of successful cooperation: positive interdependence, individual accountability, promotive interaction, appropriate use of social skills, and group processing. *Positive interdependence* occurs when a student's success is dependent on the success of his or her group mates, and includes both outcome and means interdependence. Outcome interdependence involves a state of interdependence with either goals or rewards, and results in increased achievement and productivity. Means

interdependence includes resource, role, and task interdependence, such that an educator may divide resources amongst group mates, assign roles to students within a group, or assign specific tasks within a larger project to students. *Individual accountability* exists when a learner feels that he or she must do his or her part to experience success, and *promotive interaction* requires groupmates to encourage and facilitate each other's success. *Appropriate social skills* include those such as trust, communication, social support, and conflict resolution. Lastly, successful cooperation requires *group processing*, or constructive criticism of one's own and each other's performance, both socially and academically (Johnson & Johnson, 2009).

The cooperative learning approach is founded on the assumption that without appropriate teamwork skills, students cannot complete their academic work. Thus, cooperative classrooms aim to establish trust, teach students strong communication skills, develop a sense of social support among students, and develop conflict resolution skills (Johnson, Johnson, & Holubec, 1993), all of which are key components of approaches to social emotional competence. However, cooperative learning is largely viewed as an instructional technique rather than a plausible social emotional intervention, and is often overlooked in social emotional research and practice.

Clover Leaf Model

The Clover Leaf Model, the guiding approach for this study, is a clinical-developmental model of resiliency and social emotional competence, connecting research in adolescent psychopathology with research in social emotional competence and resilience. This approach assumes that healthy social emotional development is a protective factor for problematic behaviors such as bullying and antisocial conduct, and

aims to assist early diagnoses of potential clinical disorders through the assessment and identification of young people's social emotional strengths and resiliencies (Malti & Noam, 2016; Noam & Malti; 2008; Noam, Malti, & Guhn, 2012). This model was first proposed by Gil Noam and Tina Malti in 2008, but little empirical research has been published in its support.

The Clover Leaf Model presents adolescent development as four leaves of a clover, each representative of a different social emotional domain: need for action, assertiveness, interpersonal sensitivity and belonging, and reflection. These four domains are considered to be different developmental "worlds," each requiring different levels of social emotional functioning. *Need for action* represents a child's physical connection to the world, and includes spontaneous action, curiosity, and an understanding of behavior in terms of its consequences. *Assertiveness* refers to a youth's voice, self-control, and capacity to act on and influence the world around them. Assertiveness is associated with leadership qualities and an understanding of behavior in terms of what is best for oneself. *Interpersonal sensitivity and belonging* requires empathy, sensitivity, prosocial behavior, and perspective taking. Finally, *reflection* involves responsibility and thoughtfulness, and requires the ability to understand and coordinate divergent perspectives. Though these four "leaves" are present across the course of development, they vary in importance and expression. That is, all four domains are a necessary component of healthy development from early childhood through young adulthood, but may manifest differently and be central to development at different life stages. Action orientation, for example, is most important in early childhood, but still plays a role in adolescent development and behavior. How adolescents display their action orientation, however, will look notably

different than younger children's displays of this domain (Malti & Noam, 2016; Noam et al., 2012; Noam, Malti, & Karcher, 2013).

Each domain is associated with specific risk factors and emotional and behavioral disorders, such that a young person lacking competence in a domain will likely display behavioral or emotional issues related to that domain. For instance, a youth struggling with a need for action or assertiveness will likely display externalizing behavior issues such as ADHD or aggressive behavior, whereas a youth struggling with belonging or reflection will likely display internalizing behavior issues such as emotional problems, depression, or loneliness (Noam et al., 2012; Noam et al., 2013).

Holistic Student Assessment. Unlike most models of social emotional competence, the Clover Leaf Model has its own unique assessment: The Holistic Student Assessment (HSA). The HSA is an 86 item measure of social emotional risks and resiliencies, designed to help schools and communities adapt programming or services to facilitate social emotional well-being. The HSA measures important life skills as well as the four main domains (resiliencies) of the Clover Leaf Model; rather than measuring the four domains directly, they are often assessed by measuring associated skills. Action orientation, for example, is measured by items directly addressing a skill named "action orientation" as well as emotional control, while belonging is measured both by sympathy and trust items. The original version of this tool can be administered to children and adolescents ages 10 (4th grade) to 18 (12th grade), and an adapted self-report and parent/teacher-report measure has been created for younger children (ages 3 to 8; Malti & Noam, 2016; PEAR, 2015).

The HSA was adapted from the Resilience Inventory (RI; PEAR, 2015), a measure of adolescent resilience that addressed six constructs: optimism, self-efficacy, relationships with adults, peer relationships, interpersonal sensitivity, and emotional control. Though empirical research suggests the RI is a valid measure of adolescent resiliency (Song, 2003), it was primarily developed as a tool for research, offering little to practitioners interested in individual student development. Consequently, Noam and colleagues adapted the RI, creating the more practical HSA, a measure that provided practitioners with individual profiles of students' social emotional strengths and challenges (PEAR, 2015).

To date, only one peer reviewed study has examined the psychometric properties of the HSA. In this study, Noam and colleagues (2012) administered a shortened version of the HSA (described below) to a sample of 423 children and adolescents (4^{th} to 9^{th} grade) in the Boston Public Schools. Though the demographic characteristics of the sample were not reported, Noam and colleagues stated the schools were composed of "high proportions of at-risk youth and low-income backgrounds" (p. 205), and that the sample reflected the ethnic diversity of the schools.

This study only included the four subscales of the HSA that represent the four main dimensions of the Clover Leaf Model: action orientation (five items; α = .72), assertiveness (six items; α = .69), interpersonal sensitivity/belonging (eight items; α = .81), and reflection (nine items; α = .86). Sample items include: "I like being active," and "I try to understand how other people think and feel about things" (Noam et al., 2012).

Factor analyses of each individual scale confirmed a unidimensional structure, and an exploratory factor analysis (EFA) of all 27 items found 1 general resiliency factor.

Noam et al. then conducted an exploratory bi-factor analysis, a technique that allows for the examination of second-order factors, to examine this hierarchical structure while accounting for correlations among factors. This analysis found one primary factor (resilience) and three secondary factors (action orientation/assertiveness, interpersonal sensitivity/belonging, and reflection), with assertiveness and action orientation items largely loading on the same factor.

The authors also argued that because none of the constructs was either risk or protective factors for all measures of psychopathology, the instrument evidenced convergent validity. As hypothesized, the different scales were predictive of unique internalizing/externalizing symptoms (e.g., action orientation predicted ADHD; interpersonal sensitivity/belonging was negatively associated with internalizing symptoms). Thus, Noam and colleagues (2012) concluded that HSA is a "psychometrically valid" assessment of social emotional resilience.

Conclusions

Social emotional competence reflects a popular topic of study in psychology and education. However, early work failed to identify one consistent definition of "competence," resulting the creation of many different frameworks, each similar yet somewhat distinct from the next. The present review briefly summarized six popular frameworks of social emotional competence largely situated within the K-12 education system: social emotional learning, noncognitive factors, Strive Together, 21st century competencies, cooperative learning, and the Clover Leaf Model, which is the guiding approach for this study. Many more models exist than the handful summarized in this review, including those within higher education (e.g., noncognitive assessment model;

Sedlacek, 2004), developmental psychology and psychopathology (e.g., Social Emotional Learning Framework [SELF]; Lipton & Nowicki, 2007), and those developed by and for practitioners or grassroots organizers (e.g., building blocks of human achievement, MHA Labs, 2016; Ways of Being model, Blyth et al., 2015). Despite these many understandings of competence, social emotional research is a prolific field in education, for it consistently finds relationships between these skills and important developmental outcomes.

Social Emotional Competence and Student Success

The majority of social emotional research has been conducted by K-12 researchers and applied in K-12 schools. Consequently, social emotional research has largely aimed to document positive student outcomes, such as improved mental health, increased academic engagement and achievement, and decreased substance use and antisocial behavior (e.g., Greenberg et al., 2003). The present review will focus on the two outcomes examined in the present study: academic achievement and student behavior.

Achievement

Academic achievement has been a popular outcome in social emotional research, for in addition to political and societal interest in student performance, many researchers argue that social emotional skills provide the foundation for academic performance (Osher, Bear, Sprague, & Doyle, 2010). Academic achievement is commonly measured with standardized test scores (e.g., Snyder et al., 2010), though some research has also utilized student grades (e.g., Linares et al., 2005).

Overall, research has documented a positive relationship between social emotional skills and student achievement (e.g., Bavarian et al., 2013; Linares et al., 2005; Osher, Friedman, & Kendziora, 2014; Rimm-Kaufman, Fan, Chiu, & You, 2007; Snyder et al., 2010). For example, a well-cited meta-analysis of 213 school-based, universal social emotional programs found that social emotional interventions were associated with increased academic achievement (Durlak et al., 2011). Using Cohen's U_3 index, Durlak and colleagues converted this effect size (0.27) into an average percentile gain, and found that the average student participating in a social emotional intervention demonstrated an 11-percentile point gain in achievement on standardized test scores, as compared to the average student in the comparison school who, in order to provide a baseline, was viewed as being at the 50^{th} percentile. This finding has been widely cited in the literature.

Another matched-pair, cluster-randomized, controlled study of Positive Action, a comprehensive school-wide social emotional and character development program, also found evidence of a relationship between social emotional competence and academic achievement. Although all schools were well below the state average achievement level pre-intervention, Positive Action schools (as compared to control schools) experienced great academic growth, nearly meeting or exceeding state averages one year post-intervention (Snyder et al., 2010). Taken together, these findings suggest that social emotional skills have a lasting impact on student achievement.

Behavior

Student behavior is yet another common outcome in social emotional intervention research. Researchers often argue that the cause of misbehaviors (e.g., goodness of fit between the student and school, cultural factors, high academic demands, negative

responses to challenging student behaviors; Osher et al., 2010) may be solved by developing students' social and emotional competence. In social emotional research, student behavior includes such constructs as disciplinary action in schools (e.g., suspensions), internalizing behaviors (e.g., emotional distress), and externalizing behaviors (e.g., conduct problems, substance use).

Several studies have documented a relationship between social emotional competence and improved student behavior (e.g., Aber, Jones, Brown, Chaudry, & Samples, 1998; Battistich, Schaps, Watson, Solomon, & Lewis, 2000; DuRant, Barkin, & Krowchuk, 2001; Faria, Kendziora, Brown, O'Brien, & Osher, 2013; Osher et al., 2014; Snyder et al., 2010). The same meta-analysis described above (Durlak et al., 2011) found that compared to controls, students attending schools having implemented social emotional interventions developed improved social emotional skills, attitudes, and behaviors and demonstrated decreased emotional distress and conduct problems. All of these findings persisted at follow-up, which occurred at least six months after the intervention ended.

In addition, the Conduct Problems Prevention Research Group (2010) conducted a three-year longitudinal study of the Fast Track Promoting Alternative Thinking Strategies (PATHS) program, a social emotional curriculum, with 2,937 first grade students across 370 classrooms (190 intervention classrooms, 180 comparison classrooms from matched schools). By third grade, students who received the intervention experienced fewer problems with authority acceptance and cognitive concentration as well as greater social competence, as measured by sociometric nominations (i.e., peer

ratings) and teacher ratings. As to be expected, researchers found stronger and more persistent effects for more stable, affluent schools.

Though many studies have found positive relationships between social emotional competence and improved student behavior, it is important to recognize that not all research finds such effects. A randomized controlled trial of the same program (PATHS) in the United Kingdom found no statistically significant effect on child behavior or emotional well-being post-baseline, despite having a large sample size of 5,074 children in 56 primary schools (Berry et al., 2016). This may be due to any number of reasons, such as poor implementation fidelity or cultural differences between the United States (the country in which the intervention was developed) and the United Kingdom. The failure to replicate in a different country would be consistent with concern about culture-specific elements of social emotional approaches (described in more detail below).

In sum, a large body of work supports the relationship between social emotional competence and student success. The present review focused on two commonly studied outcomes in educational research: academic achievement and student behavior. Overall, numerous intervention studies – many of which were randomized controlled trials – have found impressive effects of social emotional interventions on student achievement and behavior. Despite these promising outcomes, however, the field is not without limitations, some of which may call into question the validity of this work for diverse student populations.

Limitations of Social Emotional Research

The early popularization of social emotional research has resulted in a massive body of work, but the speed at which this field developed has created many challenges

that have yet to be addressed. First, social emotional competence, and SEL in particular, is an applied, problem-based field. Rather than emerging from a solid theoretical foundation, this field was developed to solve practical problems in schools: low student achievement and a high frequency of problem behaviors (Hoffman, 2009). Once social emotional skills training proved to be an adequate solution to these concerns, the focus of research shifted from why and how these interventions worked to developing new, more innovative interventions. Consequently, this entire body of work is lacking theoretical foundations, which is particularly problematic for the conceptual models identified above. Without a strong theoretical foundation, hypotheses about how and why social emotional competence produces success outcomes are difficult to develop. These limitations are detrimental to intervention research, for researchers are forced to develop interventions using educated guesses as to what skills will produce desired outcomes rather than using an empirically supported theory to guide development and produce change.

Similarly, models of social emotional competence are lacking mechanisms of change. This has been exacerbated by the nature of educational research, for experimental studies are rare, particularly those documenting causal relationships between intra- and interpersonal skills and academic, career, and life success (e.g., National Research Council, 2012). Very few models (e.g., Farrington et al., 2012) identify theoretical relationships between social emotional constructs and success outcomes, and to date, no models have tested those relationships. Instead, the norm is to identify a set of competencies that have individually and empirically demonstrated a relationship to academic, career, or life success (e.g., CASEL, 2013, Strive Together, 2013a). Without

identifying mechanisms of change, we cannot be certain what components are causing what success outcomes. Beyond posing a challenge to the development of new interventions, this becomes problematic when an intervention needs to be adapted or when it does not produce expected outcomes. In this case, we cannot identify why the intervention was not successful or what components can and should be altered to maximize the outcome of interest.

The two limitations described above may be due to the quick success and popularization of social emotional competence, as the focus of this research remained on developing and evaluating interventions rather than evaluating and improving conceptual models. Although applications of social emotional competence are of the utmost importance, a focus on conceptual and theoretical bases of social emotional models will ultimately improve their utility in community and educational settings by clarifying exactly how these interventions produce change.

Social emotional intervention research has clearly dominated the field, but most interventions have neglected early childhood students and classrooms. Social emotional work in developmental psychology is largely clinical, aiming to diagnose deficits rather than develop competence. This is especially concerning when considered in tandem with the fact that all 50 states have formal preschool standards for social emotional development (CASEL, 2017b), for little is known about how conceptual models apply to early childhood students, yet daycare, preschool, and kindergarten classrooms are expected to teach students social and emotional skills.

The jangle fallacy, or the use of different names and measures to examine the same construct, is clearly present in social emotional research (National Research

Council, 2012; Osher et al., 2016; Venator & Reeves, 2014). The language used within the social emotional literature is inconsistent across models, yet these models seem to address many of the same skills. What one model terms "social emotional learning," another may term "21st century skills," "soft skills," "noncognitive skills," or "new basic skills," among others (Duckworth & Yeager, 2015). Similarly, what one model names "emotional competence," others may name "ways of feeling," "self-regulation," or "self-management." This is cause for confusion amongst practitioners and other stakeholders (e.g., parents, students, school administrators), as the similarities between these skills are not always apparent. This also poses a challenge for research in that it is difficult to identify and utilize the entire body of literature. By adopting a common language, we can advance the field at a quicker pace, moving the work forward in unison as opposed to moving forward in separate yet closely related directions.

As is common with much educational and psychological research, the development of accurate and culturally-sensitive assessment tools has been particularly challenging for both social emotional research and practice. Although many independent measures exist (e.g., Strive Together, 2013b), they are not commonly utilized in practice, for social emotional interventions largely offer assessments for purchase (e.g., Haggerty, Elgin, & Woolley, 2011). Because these assessments are unavailable to researchers, they cannot be independently analyzed, and thus, little is known about their psychometric properties (e.g., validity, reliability).

Most social emotional assessment tools utilize self- or teacher-report methods, and although self-report is sometimes the best method for many social emotional constructs (e.g., sense of belonging, emotional experience), the sensitive nature of certain

constructs raises concerns for social desirability and other response biases (Duckworth & Yeager, 2015). Furthermore, when intervention outcomes (e.g., increase in standardized test scores) are associated with high stakes (e.g., accountability, program funding), teachers and other school staff may feel pressure to inflate students' scores. Observations are a promising approach to social emotional assessment, but are too time consuming and expensive for many schools.

Overall, the limitations presented above can largely be addressed by carefully planned and rigorous research and evaluation. However, one remaining limitation poses a major threat to the entire field of social emotional research, calling into question the validity and generalizability of the research findings as well as the appropriateness of implementing social emotional standards and policies into the K-12 educational system: the role of culture in defining competence.

The ultimate goal of SEL and social emotional skills training is to produce a predefined level of social emotional competence among students. This goal, however, seems to assume that an objective, universal, and context-free standard of "competence" exists. If social emotional competencies are, in fact, culturally-bound, their current definitions are likely only relevant for the White, European, and middle-class majority culture present within the American school system. By teaching only one view of what it means to be a socially and emotionally competent being in our schools, we may unintentionally discriminate against those students from a different cultural background, whose social and emotional norms represent a different, yet equally valid and appropriate, perspective.

What is Culture?

Although culture is a popular field of study across disciplines, there is no one widely-accepted definition of this construct. Even within the social sciences, agreeing upon a common definition of culture has proven quite controversial. Some areas have produced over 100 different definitions of culture, ranging from shared behaviors to the man-made piece of the environment to shared symbolic systems (Triandis, 1996). Because the social emotional competence literature stems from psychological research, the present review will use the American Psychological Association's (2002) definition of culture, as stated below.

> "Culture" is defined as the belief systems and value orientations that influence customs, norms, practices, and social institutions, including psychological processes (language, care taking practices, media, educational systems) and organizations (media, educational systems; Fiske, Kitayama, Markus, & Nisbett, 1998). Inherent in this definition is the acknowledgement that all individuals are cultural beings and have a cultural, ethnic, and racial heritage. Culture has been described as the embodiment of a worldview through learned and transmitted beliefs, values, and practices, including religious and spiritual traditions. It also encompasses a way of living informed by the historical, economic, ecological, and political forces on a group. These definitions suggest that culture is fluid and dynamic, and that there are both cultural universal phenomena as well as culturally specific or relative constructs. (pp. 8-9)

Culture is an ever-changing, heterogeneous construct that represents the shared values, beliefs, and behaviors within a group. In this sense, culture is more than a single characterization (e.g., race/ethnicity, gender); however, in much educational and

psychological research, culture has been conceptualized as such. While in some cases this is due to limited access to rich cultural data, this is also likely due to education's interest in achievement disparities and concerns of discrimination within a few select groups: Lesbian, Gay, Bisexual, Transgender, and Questioning (LGBTQ) youth, gender, socioeconomic status (SES), English language learners (ELL), immigrants and refugees, and race/ethnicity. It is important to recognize that cultures are not homogeneous groups of people, and that within any given culture individuals may vary in the extent to which they are a good representation of the tendencies of the larger culture (Markus & Kitayama, 1991). Thus, one cannot expect the tendencies of a cultural group to apply to all members equally and consistently.

Theoretical Perspectives

Psychological theories of culture aim to explain how and why culture impacts psychological processes (i.e., cognition, affect, motivation) and behaviors. These theories are largely focused on selfhood, examining the role culture plays in the development of one's identity or sense of self. Although many psychological theories of culture are available in the literature (e.g., Hecht & Shin, 2015; Hong & Chiu, 2001; Tajfel & Turner, 1979), only two seminal theories will be reviewed.

The self and social behavior. Harry Triandis' (1989) argued that culture is characterized by three dimensions: cultural complexity, individualism-collectivism, and tightness/looseness. Cultural complexity refers to the number of different elements present in a culture, such as writing and records, roles and responsibilities, urban settlements, money, population density, and modes of transportation, among others. A higher level of cultural complexity results in an increased number of ingroups per person.

This encourages independence and autonomy, for the importance of one single ingroup decreases. Accordingly, cultural complexity tends to be associated with individualistic cultures, such as the United States and England.

Individualism-collectivism refers to a culture's emphasis on personal versus group goals, needs, and values. Individualistic cultures prioritize the individual's goals and values, while collectivistic cultures prioritize ingroup goals, encouraging group members to maintain group harmony over personal advancement. Triandis (1989) posits that individualism likely developed as a result of cultural complexity and affluence, while collectivism is the result of limited resources and a shared fate among group members.

Triandis' (1989) final dimension of cultural variation involves the distinction between "tight" and "loose" cultures. Tight cultures have many norms that apply across many situations, and punish group members who deviate. Fewer social norms exist within loose cultures, and only those who grossly deviate from these norms are punished. Cultural tightness is associated with collectivism, while cultural looseness is associated with individualism; this dimension is theoretically unrelated to cultural complexity.

Triandis (1989) also identified three different "selves" that have different implications for social behavior: the private, public, and collective self. The private self includes self-assessments of one's own traits, states, and behaviors (e.g., "I'm friendly"), and is most salient within individualistic, complex, and loose cultures. The public self refers to one's perception of what other's think of them (e.g., "People think I'm friendly), and is most salient within tight, collectivist cultures. Lastly, the collective self includes the perception of what a reference group thinks of them (e.g., "My family thinks I'm friendly"), and is most salient within collectivistic, less complex, and tight cultures.

Triandis' argued that culture influences behavior in two ways. First, the three cultural dimensions make the different "selves" (private, public, and collective) more or less salient, as described above. When a certain conception of the self is more salient than the others, one is likely to act in accordance with norms and expectations of that self. For example, if an individual from a tight, collectivist culture is in a public setting, he or she will likely attempt to demonstrate conformity and extreme kindness and deference, thereby acting in accordance with what he or she would like others to think of him or herself (i.e., acting in accordance with public self). In contrast, the private self will likely be more salient in individualistic cultures, and thus, an individual in a public setting may still act in accordance with his or her own values rather than conforming to the societal or group norms.

Culture also influences behavior by impacting the ways in which the private, public, and collective self are operationalized. The public self, for example, references those traits and behaviors that are valued within a culture. Thus, while the public self in collectivist cultures is defined by conformity and maintaining group harmony, the public self in more individualistic cultures includes such traits as autonomy, independence, and self-reliance.

Triandis' conceptualization of culture is narrower than APA's definition. Where Triandis is focused on culture as bounded by ethnicity or geography, APA allows for a more subjective boundary, including such groups as race, gender, or even a school or classroom. Although Triandis' work may be too narrow for modern educational settings, his ideas about the interrelationships between one's selfhood, culture, and social

expectations can provide great insight into educational practice and differences in expectations about social and emotional development.

Independent and interdependent self-construals. Hazel Markus and Shinobu Kitayama (1991) coined the term "self-construal" to describe understandings of ourselves in relation to others. Markus and Kitayama identified two types of self-construals: independent and interdependent. Independent self-construals consider the self to be fundamentally separate, or independent, from others. Those with independent self-construals view the self as composed of a set of internal, coherent, and stable attributes (e.g., personality traits, abilities, opinions, judgments), and are therefore focused on self-advancement and other personal goals such as self-actualization and self-expression.

In contrast, interdependent self-construals consider the self to be fundamentally linked to others and the social context of which one is a part. Because those with interdependent self-construals view the self as part of a larger social relationship, their behavior is determined by the thoughts, feelings, and actions of specific others within a specific context. The interdependent self is most meaningful when it is part of a meaningful relationship, and thus, the interdependent self encourages such behaviors as the promotion of group goals and occupation of one's place in the social hierarchy.

Although the interdependent self is not defined by a set of internal attributes, those with interdependent self-construals may still identify with such attributes. However, rather than viewing these traits as stable and domain-general as the independent self does, the interdependent self tends to identify with domain-specific attributes (e.g., "I am responsible in school," "I am a caring teacher"). This minimizes the predictive validity of internal attributes for the interdependent self, for it increases measurement error and

challenges the assumption of stable, domain-general traits influencing one's cognition, affect, and behavior across contexts.

Self-construals influence cognition, affect, and motivation in many ways. For example, as compared to those with independent self-construals, those with interdependent self-construals tend to be more attentive and sensitive to others, display other-focused more than ego-focused emotions, and express and experience more social as opposed to personal motives.

Overall, psychological theories of culture provide us with a lens by which we can explore different conceptions of selfhood, focusing on how these self-conceptions impact one's cognition, affect, and behavior. In this way, the psychological approach to culture may inform social emotional research, particularly by defining these competencies in culturally-relevant ways; identifying the relative importance of these competencies cross-culturally; and predicting whether (and how) these competencies impact academic, work, and life success cross-culturally.

How Does Culture Impact Social Emotional Competence?

Learning is an inherently social process. Basic knowledge of oneself and others, including social norms and societal expectations, are largely learned through the socialization practices of caregivers, teachers, and other adults as well as through interactions with peers. This knowledge, however, is bound to the culture or society in which one was socialized (Hecht & Shin, 2015; Hoffman, 2009).

Culture influences social emotional competence in three ways. First, culture determines how social emotional competencies are defined. For example, within more individualistic cultures, self-awareness is defined as an awareness of one's own emotions,

thoughts, and influences, but in more collectivist cultures, self-awareness requires a broader awareness of others as well as the larger context of which one is a part. Appropriateness of social interactions is also dependent upon the culture of which one is a part. In individualistic cultures, assertiveness and confidence are considered appropriate and valuable traits, while humbleness is more widely accepted in collectivist cultures (Hecht & Shin, 2015).

Next, culture impacts the processes by which the competences are developed and enacted. The processes by which decisions are made provide an illustrative example. While individualistic cultures tend to make decisions in a more logical and rational manner, collectivist cultures emphasize ingroup harmony in decision making, avoiding those decisions that may conflict with the interests of another ingroup member. These cultures also differ in who is typically involved in the decision making process. Eastern, collectivist cultures tend to involve other parties in large decisions (e.g., involving a religious leader and family elders in health decisions), while Western, individualistic cultures encourage the individual to make these decisions by him or herself (Hecht & Shin, 2015).

Lastly, culture determines the relative importance of different competencies. Individualistic cultures prioritize the self over the group, emphasizing individual goals, interests, and needs. Consequently, individualistic cultures emphasize self-focused competencies (e.g., self-awareness, self-management) over the more social competencies. Collectivist cultures prioritize group goals, interests, and needs over personal interests thereby emphasizing other-focused (e.g., social awareness, relationship skills) over self-focused competencies (Hecht & Shin, 2015).

Although culture is more than a single characterization (e.g., individualism/collectivism), psychological and educational researchers often operationalize it as such (e.g., race/ethnicity, socioeconomic status, gender). Culture is a difficult construct to capture, and researchers are often limited by the data they can collect. Thus, much of what we know about cultural differences – including those examples provided above – are reflective of the general values, norms, and expectations of one component of a culture. When applying or examining cultural differences in social emotional variables and educational settings, it is important to develop a deeper understanding of the cultural background of the research study context (classroom, school) and sample.

Although the above suppositions are based on little empirical social emotional research, a large body of social psychological research supports these claims, demonstrating significant cultural variation in many intra- and interpersonal skills and behaviors (e.g., social competence, Chen & French, 2008; personality, Markus & Kitayama, 1998; competence and motivation, Plaut & Markus, 2005; emotional experience and expression, Markus, Kitayama, & VandenBos, 1996). For example, empirical work studying emotional experience and expression, key components of many social emotional interventions (Hoffman, 2009), found that those emotions identified as universal tend be highly abstract and basic (e.g., anger, disgust), while more detailed and concrete definitions of emotion are culturally-bound (Mesquita & Frijda, 1992). Although anger is often considered a universal emotion, the experience of anger differs widely between cultures. In individualistic cultures, anger is considered natural and empowering, for it is a response to the blocking of one's personal needs and desires. In collectivist

cultures, however, anger is a more shameful experience, as it is considered to be an unnatural emotion that interferes with group harmony (Markus et al., 1996).

Between empirical work (e.g., Chen & French, 2008; Markus & Kitayama, 1998; Plaut & Markus, 2005; Mesquita & Frijda, 1992) and critical reviews (Hoffman, 2009; Garner et al., 2014), it is clear that social emotional competence manifests itself in ways specific to the sociocultural characteristics of the individual as well as the larger sociocultural context of which they are a part. However, very little social emotional research has addressed this assertion, and the work that has is largely focused on identifying gender, racial, and ethnic differences in quantitative measures of social emotional competence (Garner et al., 2014) rather than challenging the assumptions of these conceptual models.

Conclusions

Over the past two decades, social emotional competence has become a popular field of study. Many researchers have developed their own models of social emotional competence, and while each model includes a slightly different set of skills, they are very similar in scope. Given the immense pressure from policymakers and practitioners to develop a panacea for low achievement, the majority of social emotional research has focused on developing and evaluating universal, school-based interventions that develop social skills and ultimately improve student achievement and attainment. Unfortunately, the applications of social emotional competence progressed before researchers developed well-established conceptual and empirical foundations, leaving many concerns unaddressed. These include a lack of evidence supporting model structure, the failure to

identify mechanisms of change, and most importantly, the neglect of cross-cultural variation in social emotional competencies.

Most researchers have conceptualized social emotional competence as operating independently of cultural differences, ignoring important social messages cultures give about appropriate behavior. Social emotional research largely assumes these competencies are universal, applying the same definitions and assessments to all students regardless of cultural background. If, however, these skills are culturally-bound, implementing social emotional interventions, standards, and policies may ultimately perpetuate the cycle of inequality and widen, rather than reduce, the achievement gap between White students and students of color.

If social emotional work is to progress in an equitable and meaningful direction, it is imperative that future research address the role of culture in competence, challenging the assumptions present in the literature. This dissertation aims to do just that, exploring the cultural relevance of social emotional competence, as measured by a shortened version of the Holistic Student Assessment, among a large, culturally diverse sample of students in MPS.

This chapter has outlined the field of social emotional competence: it has described a handful of conceptual models, summarized empirical support for relations between competence and important educational outcomes, and detailed limitations of the field, focusing on the lack of research examining the cultural relevance of what the literature has identified as “social emotional competence.” The next chapter, Chapter Three, will describe this study’s methodology.

Chapter Three: Methodology

The purpose of this study is to examine the predictive validity and cultural relevance of social emotional competence in educational settings using a shortened version of the Holistic Student Assessment (HSA). This study has identified four research questions:

1. To what extent are social emotional skills (empathy, emotional control, critical thinking, assertiveness) related to one another?
2. On average, do students of different cultural groups (i.e., race/ethnicity, home language, income status, gender) score differently on measures of social emotional skills (empathy, emotional control, critical thinking, assertiveness)?
3. To what extent do social emotional skills (empathy, emotional control, critical thinking, assertiveness) predict student achievement, above and beyond traditional predictors of achievement?
    a. How are social emotional skills related to traditional predictors of academic success and achievement?
    b. Is the relationship between social emotional skills and student achievement invariant across cultural groups (i.e., race/ethnicity, home language, income status, gender)?
4. To what extent do social emotional skills (empathy, emotional control, critical thinking, assertiveness) predict student behavior, above and beyond traditional predictors of behavior?

Because very little empirical work has examined the relations of culture with social emotional competence in school systems, the present study is largely exploratory in nature. However, based on social psychological and theoretical work examining

culture and social emotional competence, it is hypothesized that: (1) all four social emotional variables (i.e., assertiveness, critical thinking, emotional control, empathy) will be significantly correlated with one another; (2) on average, different cultural groups will score differently on measures of social emotional competence; and (3) social emotional competence will predict student achievement and behavior, but the relationship between social emotional competence achievement will be moderated by cultural group membership.

Methods

Design

This study included both exploratory and descriptive components, analyzing secondary data to explore the relationship between social emotional competence and success outcomes (i.e., academic achievement and behavior; descriptive research), with a focus on culturally diverse students (exploratory research).

Participants

Several classrooms within Minneapolis Public Schools (MPS) completed the HSA, a measure of social emotional competence, during May of 2016. Data were received from 6,724 students across 52 schools. Though the survey was largely administered to 4th, 6th, 8th, and 10th grade students, 121 students in 5th, 7th, 9th, 11th, and 12th grade completed the survey as well (5th grade: 11 students; 7th grade: 16 students; 9th grade: 1 student; 11th grade: 82 students; 12 grade: 11 students).

Three alternative schools were removed from analyses, as they served unique populations (e.g., students with Emotional and Behavioral Disorders) and together included only 22 respondents. Another 77 students were removed from analyses after

social emotional competence scores were computed, as these students selected the most extreme response option for all 15 items, and therefore had average scores of 4.0 for all 4 scales (i.e., assertiveness, critical thinking, empathy, emotional control). Overall, 0.01% of the data were removed from analyses.

Table 1. Participant Demographics

	N (%)				
	Full Sample	**Grade 4**	**Grade 6**	**Grade 8**	**Grade 10**
N	6,623 (100.0)	2,059 (31.1)	1,692 (25.5)	1,524 (23.0)	1,229 (18.6)
Gender					
Female	3342 (50.5)	1044 (50.7)	846 (50.0)	787 (51.6)	607 (49.4)
Male	3281 (49.5)	1015 (49.3)	846 (50.0)	737 (48.4)	622 (50.6)
Ethnicity					
White	2697 (40.7)	878 (42.6)	718 (42.4)	587 (38.5)	467 (38.0)
African American	2135 (32.2)	649 (31.5)	536 (31.7)	512 (33.6)	386 (31.4)
Hispanic	1085 (16.4)	352 (17.1)	265 (15.7)	250 (16.4)	209 (17.0)
Asian	538 (8.1)	124 (6.0)	136 (8.0)	123 (8.1)	144 (11.7)
American Indian	168 (2.5)	56 (2.7)	37 (2.2)	52 (3.4)	23 (1.9)
Home Language					
English	4534 (68.5)	1456 (70.7)	1180 (69.7)	1053 (69.1)	767 (62.4)
Spanish	924 (14.0)	316 (15.3)	211 (12.5)	208 (13.6)	184 (15.0)
Somali	699 (10.6)	182 (8.8)	188 (11.1)	154 (10.1)	150 (12.2)
Hmong	238 (3.6)	57 (2.8)	51 (3.0)	45 (3.0)	79 (6.4)
Other	228 (3.4)	48 (2.3)	62 (3.7)	64 (4.2)	49 (4.0)
FRL Eligible	3734 (56.4)	1165 (56.6)	924 (54.6)	877 (57.5)	704 (57.3)
HHM	312 (4.7)	112 (5.4)	76 (4.5)	77 (5.1)	33 (2.7)
Special Education	658 (9.9)	200 (9.7)	164 (9.7)	171 (11.2)	113 (9.2)
Gifted	1169 (17.7)	479 (23.3)	413 (24.4)	123 (8.1)	142 (11.6)
				M (SD)	
Age	12.44 (2.38)	9.74 (.48)	11.77 (.50)	13.76 (.52)	15.91 (.76)

Note. Full sample includes 121 5th, 7th, 9th, 11th, and 12th grade students.

The final sample included 6,623 students across 49 schools. Participants were representative of students within in the district (see Table 1 for demographics), though the present study's sample was slightly more White and affluent. As of October 2015, 37.7% of K-12 students in MPS identified as African American (versus 32.2% in the

sample), 33.7% as White (versus 40.7% in the sample), 18.5% as Hispanic (versus 16.4% in the sample), 6.4% as Asian American (versus 8.1% in the sample), 3.7% as American Indian (versus 2.5% in the sample), and 0.1% as Pacific Islander (Minneapolis Public Schools, 2015b). Over half (62.6%) of students in MPS were eligible for free or reduced price lunches (FRL; Minneapolis Public Schools, 2015a), a number slightly larger than the percent of FRL eligible students in the sample (56.4%).

Measures

Achievement. Academic achievement was measured with the Minnesota Comprehensive Assessment (MCA), a standardized state test measuring student progress toward Minnesota's academic standards. The MCA is administered from 3rd grade through high school. This test includes separate reading, mathematics and science sections, which are sometimes administered in different years. For instance, the science test is only taken once in elementary school (5th grade) and once during high school, while the reading and mathematics tests are administered each year from 3rd through 8th grade, and again in 10th (reading) or 11th grade (mathematics; Minnesota Department of Education, n.d.).

The present study utilized students' mathematics and reading growth z-scores – computed by MPS between spring 2015 and spring 2016 – as outcome variables. Although alternative approaches may have been preferable (e.g., gain scores adjusted for prior achievement; Maris, 1998), unadjusted growth was selected to ensure that this research aligned with current and past work at MPS. In addition, growth z-scores were selected over raw MCA scores for two reasons. First, including growth scores removed one additional predictor from the model (i.e., prior achievement, as measured by 2015

MCA scores), thereby increasing model parsimony. Next, and most importantly, the scale of the raw scores would necessitate separate models between grades, for students' grades precede their raw score, such that a fourth-grader might have a score of 450, but a sixth-grader would have a comparable score of 650. Psychometrically, however, the scores are not perfectly scaled, and removing the grade number from students' scores is considered an inappropriate technique for analyses. Summary statistics regarding students' growth scores are available in Chapter Four.

Behavior. The second outcome variable, student misbehavior, was operationally defined in partnership with staff in Research, Evaluation, Assessment, and Accountability (REAA) in MPS. For the purposes of this study, misbehavior was defined as total number of behavioral referrals received during the 2015-2016 AY. Student referrals were selected because the district was particularly interested in this outcome, and because referrals were not quite as rare as other disciplinary actions (e.g., suspensions). Summary statistics regarding student referrals are available in the Data Analysis section below.

Social emotional competence. Social emotional competence, the focal variable in this study, was measured by a shortened version of the Holistic Student Assessment (HSA), a self-report measure of students' resiliencies and social emotional strengths. This version included 15 items across 4 subscales: empathy (4 items), emotional control (3 items), critical thinking (4 items), and assertiveness (4 items; see Appendix A for a copy of the survey). Each item is scored on a four-point scale: not at all (1), sometimes (2), often (3), almost always (4). Results from a confirmatory factor analysis of the subscales, reliability coefficients, and mean scores on the HSA are reported in Chapter Four.

Culture. Culture was operationalized as four background variables, collected from MPS student records: race/ethnicity (i.e., White, African American, American Indian, Asian, Hispanic), home language (i.e., English, Spanish, Somali, Hmong, other/unknown), socioeconomic status (as measured by free/reduced price lunch eligibility), and gender (male/female only). Some of these four variables may be closer conceptualizations of culture than others. Home language, for example, provides a more detailed picture of students' ethnic backgrounds (e.g., separates Hmong from Asian students), while gender may grossly oversimplify students' cultural identities (e.g., assuming gender is binary). Though these categorical operational definitions of culture are indeed overly simplistic, they were the best representation of culture available for this research. Students' cultural identities are highly abstract and challenging to capture quantitatively, and using background variables provides a more practical approach by analyzing data already collected by and important to the schools.

Background and demographic characteristics. MPS also provided several demographic and background variables from student records, such as special education enrollment, homeless/highly mobile status, GPA, number of behavior infractions, and number of in-school removals.

Data Analysis

Preliminary analyses. Preliminary analyses examined the properties of the HSA and the associations among predictor and outcome variables. First, a confirmatory factor analysis (CFA) ensured the four-factor structure held in the study's sample. Next, the HSA's internal consistency reliability was examined by calculating coefficient alpha for both the full sample and each cultural group; this approach ensured that students were

responding consistently to these items, and that the HSA was equally reliable for students of diverse cultural backgrounds. Finally, basic correlational analyses examined the interrelationships of HSA domains with demographic variables, academic achievement, and student behavior.

Research question 1. The first analyses aimed to identify the magnitude and direction of the interrelationships among the four social emotional competencies by calculating bivariate correlations between mean scores for each construct. Because scores on each social emotional competency were expected to vary by cultural group membership, correlations between the four social emotional competencies were examined within the four cultural groups (i.e., background variables) using Fisher's transformation and Fisher's *r* to *z* (Ferguson, 1959). This method, including a justification for it, is described in greater detail in Chapter Four.

Research question 2. Next, analyses aimed to determine the extent to which students' cultural backgrounds predicted their level of social emotional competence. This involved conducting four multiple regression analyses, with gender, race/ethnicity, home language, and socioeconomic status serving as the independent (i.e., predictor) variables and each social emotional competency serving as a dependent variable. These regressions were conducted within grade – for a total of 16 regression models overall – to account for the potential for developmental differences. In each regression, the independent variables were dummy coded: gender was coded as 1 (male), 0 (female); the five racial/ethnic groups (African American, Indian, Asian, Hispanic, and White) were coded 1, 0 with White serving as the reference group; the five home language categories (Hmong, Somali, Spanish, other/unknown, English) were coded 1, 0 with English serving as the

reference group, and socioeconomic status was coded as 1 (FRL eligible), 0 (not FRL eligible).

Research question 3. These analyses served two purposes: (1) to determine the extent to which social emotional competence, as measured by the HSA, predicted student achievement, as measured by the MCA, and (2) to determine whether the relationship between social emotional competence and academic achievement for students of diverse cultural backgrounds was similar to the relationship for students within the majority culture. This involved conducting two hierarchical linear models (HLM), one predicting student growth (between spring 2015 and spring 2016) on the MCA mathematics test and another predicting student growth (between spring 2015 and spring 2016) on the MCA reading test.

The two HLMs were identical in process and involved several steps. First, a fully unconditional model, equivalent to a one-way random effects ANOVA, determined how much variance in both mathematics and reading growth was due to the school students attended. Next, cultural and control variables were added to the model: grade, gender, race/ethnicity, home language, FRL eligibility, gifted/talented, special education enrollment, HHM, total days enrolled in MPS during AY 2015-2016, and racially isolated schools. All control variables were included at level 1 (i.e., student-level) besides the racial isolation variable, which was included at level 2 (i.e., school-level).

The social emotional competencies were then added to the model to determine whether social emotional competence predicted academic growth above and beyond traditional predictors. Finally, cultural variation was modeled by including interactions of the cultural variables (i.e., gender, race/ethnicity, home language, FRL eligibility) with

the social emotional competencies (i.e., assertiveness, critical thinking, emotional control, empathy) and testing for moderator effects. However, because all cultural variables were categorical rather than continuous, including interactions of all four culture variables with all four social emotional variables would result in 40 interaction terms (i.e., 1 per social emotional construct for both gender and FRL, and 4 per social emotional construct for both race/ethnicity and home language). Therefore, interaction terms were only created for statistically significant culture and social emotional variables. Model fit was examined for each of these four models by comparing AIC/BIC statistics and conducting a deviance test between each model and the following augmented model (e.g., comparing social emotional model with control model). This is described in greater detail in Chapter Four.

Research Question 4. The final set of analyses explored the relationship between social emotional competence and student behavior, as measured by student referrals. Though total number of referrals ranged from 0 to 107 (M = .37, SD = 2.21), this variable was recoded, such that a score of 1 = student received 1 or more referral, and a score of 0 = student received no referrals. This variable was recoded for several reasons. First, only 12.6% of the students were referred during the 2015-2016 AY. Of those, the majority (80.5%) only received between 1 and 3 referrals. Second, MPS district staff expressed concern over fidelity of reporting numbers of referrals, for schools within MPS have different policies and practices for recording disciplinary data. Dichotomizing this variable prevented the overinterpretation of small differences as a function of the skewed variable "total number of referrals." Finally, the school's response to students' first referral would, in theory, impact the likelihood of obtaining another referral. For instance,

if the school's response to students' first referral was to remind them of school rules, they may not be deterred from future misbehavior. If, however, the school's response was to provide skills coaching, a restorative practice, or involving a school counselor, students may be less likely to obtain another referral, for their needs were more likely to be met. Said differently, this variable was coded dichotomously because having multiple referrals may be a function of school practices rather than a student's internal qualities.

These analyses were conducted within rather than across schools, for each school in MPS is responsible for setting their own student disciplinary policies. What one school may code as a "behavior infraction" (most liberal category), another may code as a "referral" while yet another may code as an "in school removal." Thus, the outcome variable in the present analyses cannot be considered equivalent across schools, thereby necessitating separate models.

Seven middle schools were identified for analysis in partnership with MPS: school IDs 3, 4, 15, 33, 35, 38, and 40. Running analyses on all 49 schools was considered impractical, especially because: (1) K-8 schools would need to be separated by elementary/middle school lines, which would increase the number of models but decrease the sample size, (2) several schools had too small a sample to run analyses, (3) student discipline was not considered problematic for elementary students in MPS, and (4) the middle school years were of particular interest to the district, for MPS students often struggle to transition both in and out of middle school. Middle school also tends to be the time at which problematic behaviors arise, and it is during these years that many students in MPS are diagnosed with behavioral disorders and begin to engage in risky behaviors (e.g., experimenting with drugs and alcohol).

The present analyses involved seven logistic regression models, predicting referrals (1 = 1 or more referral, 0 = no referrals) with student demographic, cultural, and background variables as well as their scores on the HSA. This model was computed hierarchically, such that all demographic, cultural, and background variables were entered first followed by social emotional variables. Though we hoped to examine potential moderator effects between social emotional competence and student culture, the samples were too small, for analyses were conducted within school, and maximum likelihood estimation (as used in logistic regression) requires a larger sample than OLS regression.

Summary

The majority of social emotional research has focused on designing and evaluating universal, school-based interventions intended to improve student achievement and educational attainment through the development of social and emotional competence. Unfortunately, the applications of social emotional competence progressed before researchers could create solid conceptual and empirical foundations, leaving many concerns unaddressed. The present study aimed to fill one of these gaps in the literature, examining the role of culture in defining and measuring impacts of social emotional "competence." This study analyzed data collected by the Minneapolis Public Schools, focusing on: (a) how culturally diverse students, as compared to majority culture students, score on a measure of social emotional competence, (b) whether social emotional competence was related to important educational outcomes (i.e., achievement, misbehavior) for students in Minneapolis, and (c) whether the relationship between competence and educational success held for culturally diverse students. Looking ahead,

Chapter Four will present the findings from the analyses described above and Chapter Five will include a final discussion of the findings, implications for the field, and suggestions for future research.

Chapter Four: Findings

As described in Chapter Three, culture was operationalized by gender, race/ethnicity, home language, and socioeconomic status. Because this operational definition of culture does not closely align with this study's definition of culture (see Chapter Two), Chapter Four will largely refer to "culture" and "cultural variables" as "background variables." The connection between these background variables and students' cultural identities will again be made in Chapter Five.

Preliminary Analyses

Before addressing the four primary research questions, several preliminary analyses were conducted, including a confirmatory factor analysis (CFA) of the HSA, basic descriptive statistics and reliabilities for the four HSA subscales (i.e., factors), and correlational analyses to examine relations between the HSA subscales and student background characteristics. Findings from these analyses are described in detail below.

Confirmatory factor analysis

First, a CFA extracted four a priori factors: assertiveness, critical thinking, emotional control, and empathy. The CFAs were completed within grade (i.e., 4th, 6th, 8th, 10th) to ensure the factor structure held for students at different developmental levels. Because each grade had a large sample size (ranging from 2,059 in 4th grade to 1,229 in 10th grade), grades were randomly split in half to create a total of 8 samples. This provided flexibility to make modifications to the model and re-run, if necessary.

The four CFA models provided an excellent overall fit to the data. All items loaded significantly on their a priori factors (see Table 2), and most factors were significantly correlated with one another (see Table 3). More specifically, among the 4th, 6th, and 8th grade samples, all six factor correlations were statistically significant, but

within the 10th grade sample, three correlations were non-significant: assertiveness with emotional control (r = .32, p = .053), critical thinking with emotional control (r = -.05, p = .055), and emotional control with empathy (r = -.08, p = .052).

Table 2. Standardized Coefficients from Confirmatory Factor Analysis for the Four-Factor Model

	Assertiveness				**Critical Thinking**				**Emotional Control**				**Empathy**			
	4	**6**	**8**	**10**	**4**	**6**	**8**	**10**	**4**	**6**	**8**	**10**	**4**	**6**	**8**	**10**
Q1	.55	.58	.60	.63												
Q4	.58	.59	.63	.63												
Q7	.55	.50	.52	.60												
Q11	.48	.61	.69	.70												
Q3					.65	.73	.69	.73								
Q5					.66	.70	.72	.71								
Q12					.70	.72	.76	.79								
Q14					.62	.59	.63	.56								
Q6									.74	.76	.76	.76				
Q8									.58	.61	.55	.60				
Q13									.82	.82	.75	.77				
Q2													.75	.71	.78	.82
Q9													.67	.69	.77	.76
Q10													.79	.79	.83	.87
Q15													.72	.79	.77	83

Note. All coefficients were statistically significant at $p < .05$.

The critical thinking factor showed some of the strongest relations, correlating highly and positively with both assertiveness (r = .65 to .80) and empathy (r = .60 to .70). These findings were surprising, for intuitively, higher levels of academic-based skills like critical thinking seem weakly related at best to the more socially- and emotionally-based skills like assertiveness and empathy. This poses the question of whether these constructs are directly related – and if so, why – or if this relation is an artifact of an unmeasured third variable or improper naming of scales (discussed in greater detail in Chapter Five). The association between assertiveness and empathy was also large in magnitude and

positive across all four grades. This finding was also counter-intuitive, for conceptually, students' abilities to identify and experience others' emotions seems largely unrelated to their tendencies to speak their minds or advocate for themselves. Otherwise, factor correlations were as expected, with a small relationship between emotional control and assertiveness, emotional control and critical thinking, and emotional control and empathy. Lower levels of emotional control were associated with greater levels of assertiveness and lower levels of both critical thinking and empathy.

Table 3. Factor Variance/Covariance Matrix

4th Grade				**6th Grade**			
	1.	**2.**	**3.**		**1.**	**2.**	**3.**
1. Assertiveness	1			**1. Assertiveness**	1		
2. Critical Thinking	.80*	1		**2. Critical Thinking**	.76*	1	
3. Emotional Control	.17*	-.14*	1	**3. Emotional Control**	.12*	-.14*	1
4. Empathy	.57*	.70*	-.24*	**4. Empathy**	.51*	.69*	-.23*
8th Grade				**10th Grade**			
	1.	**2.**	**3.**		**1.**	**2.**	**3.**
1. Assertiveness	1			**1. Assertiveness**	1		
2. Critical Thinking	.65*	1		**2. Critical Thinking**	.69*	1	
3. Emotional Control	.28*	-.04*	1	**3. Emotional Control**	.32	-.05	1
4. Empathy	.48*	.68*	-.19*	**4. Empathy**	.45*	.60*	-.08

Note. *$p < .05$, **$p < .01$, ***$p < .001$. Higher scores on emotional control indicate lower emotional control, as items were not reverse coded in the CFA.

Overall, a four-factor solution was clear. Though the chi-square statistics were statistically significant across all four grades (fourth: $\chi^2(84) = 226.62$, $p < .001$; sixth: $\chi^2(84) = 268.41$, $p < .001$; eighth: $\chi^2(84) = 263.52$, $p < .001$; tenth: $\chi^2(84) = 219.29$, $p < .001$), this is largely a function of the large sample sizes, for other fit indices suggested the models provided a good fit to the data (e.g., Maruyama, 1998; see Table 4). Thus, it

was deemed unnecessary to make modifications to the model, and the four factors were used in subsequent analyses as they were originally proposed.

Table 4. Goodness-of-Fit Indicators for Models of the HSA in Grades 4, 6, 8, and 10

	N	RMSEA	NFI	CFI	IFI
Grade 4	937	.04	.95	.97	.97
Grade 6	762	.05	.93	.95	.95
Grade 8	714	.06	.93	.95	.95
Grade 10	532	.06	.93	.96	.96

Note. RMSEA = root mean square error of approximation; NFI = normed fit index; CFI = comparative fit index; IFI = incremental fit index.

Descriptive Statistics

Because the four-factor structure provided an excellent fit to the data, the assertiveness, critical thinking, emotional control, and empathy factors (i.e., subscales) remained as proposed in subsequent analyses. Before examining students' scores on the HSA, internal consistency reliability was computed for each of the four constructs. First, internal consistency reliability was computed within grade, and then across grade, but within background characteristics. As can be seen in Table 5, the internal consistency reliability was consistent across all four grades. These subscales exhibited acceptable or good internal consistency reliability, with only one subscale (i.e., 4th grade assertiveness) exhibiting poor or questionable reliability across the four grades. The most variable reliability coefficients were among the assertiveness subscale, which ranged from α = .60 in grade 4 to α = .72 in grade 10. Otherwise, the critical thinking, emotional control, and empathy subscales had similar coefficients across all four grades (see Table 5).

Table 5. Internal Consistency Reliability (Coefficient Alpha)

	Assertiveness	Critical Thinking	Emotional Control	Empathy
Full Sample	.66	.76	.73	.85
Grade 4	.60	.73	.71	.81
Grade 6	.66	.75	.75	.83
Grade 8	.70	.72	.72	.87
Grade 10	.72	.73	.73	.87

Note. Full sample includes 121 students in 5th, 7th, 9th, 11th, and 12th grades who completed the survey.

Next, internal consistency reliability was computed within background variables to ensure the survey was equally reliable for students of different backgrounds. Again, all four scales of the HSA exhibited consistent reliability across groups. Using common rule of thumbs in psychological research, assertiveness was considered poor or questionable, critical thinking and emotional control were considered acceptable, and empathy was considered good (see Table 6).

Table 6. Internal Consistency Reliability (Coefficient Alpha) by Background Characteristics

	n	Assertiveness	Critical Thinking	Emotional Control	Empathy
Gender					
Female	3342	.66	.76	.75	.84
Male	3281	.66	.76	.70	.84
Race/Ethnicity					
White	2697	.69	.77	.72	.86
African American	2135	.63	.75	.68	.83
Hispanic	1085	.63	.77	.68	.84
Asian	538	.65	.78	.69	.84
American Indian	168	.70	.74	.70	.82
Home Language					
English	4534	.67	.76	.74	.86
Spanish	924	.61	.77	.68	.82
Somali	699	.60	.77	.67	.82
Hmong	238	.64	.79	.68	.81

	n	Assertiveness	Critical Thinking	Emotional Control	Empathy
Other	228	.70	.77	.72	.83
FRL					
Eligible	3734	.64	.76	.70	.83
Not Eligible	2889	.68	.76	.71	.86

Note. $N = 6623$

Mean scores on each of the four subscales were computed (reverse coding the negatively worded emotional control items) and can be found in Table 7. Mean scores were used because they are more interpretable than generating factor scores, for they keep the scale of the items. To determine how much variation existed between grades, between-grade differences were considered in light of the pooled standard deviation across grades, which was calculated with the formula below.

$$SD_{pooled} = \sqrt{\frac{(n_{4th} - 1)(SD_{4th}) + (n_{6th} - 1)(SD_{6th}) + (n_{8th} - 1)(SD_{8th}) + (n_{10th} - 1)(SD_{10th})}{(n_{4th} + n_{6th} + n_{8th} + n_{10th}) - 4}}$$

Using a common rule of thumb in psychological research, mean differences .20 < d < .50 were considered small, < .50 < d < .80 were considered moderate, and differences < .80 were considered large. On average, there was little variation between grades. Between 4th and 10th grade, mean assertiveness scores varied by 0.06 points, a difference of about .09 SD, and emotional control scores varied by 0.10 points, a difference of about .12 SD. Critical thinking and empathy found greater variation across grades, with critical thinking scores varying by 0.24 points (.37 SD), and empathy by 0.33 points (.46 SD). Variation across grades was not linear (i.e., scores did not increase at each grade level); rather, scores were at their lowest in eighth grade and tended to be at their highest in tenth grade. Critical thinking was the only exception to this observation, with students scoring highest in fourth grade.

Table 7. Mean Scores by Grade

	Assertiveness	Critical Thinking	Emotional Control	Empathy
Grade 4	3.06 (.64)	3.22 (.65)	3.04 (.85)	3.46 (.65)
Grade 6	3.05 (.65)	3.07 (.65)	3.04 (.83)	3.33 (.69)
Grade 8	3.00 (.64)	2.98 (.67)	2.97 (.80)	3.13 (.76)
Grade 10	3.01 (.66)	3.08 (.63)	3.07 (.78)	3.17 (.76)
Full Sample	3.03 (.65)	3.10 (.66)	3.03 (.82)	3.29 (.72)

Note. Full sample includes 121 students in 5^{th}, 7^{th}, 9^{th}, 11^{th}, and 12^{th} grades who completed the survey. Scores range from 1 to 4, with higher scores indicating stronger skills. $SD_{PooledAssertiveness}$ = .65; $SD_{PooledCriticalThinking}$ = .65; $SD_{PooledEmotionalControl}$ = .82; $SD_{PooledEmpathy}$ = .71.

Due to the large sample size, this study had high power and could detect very small effects, regardless of their practicality; thus, all findings were considered in terms of both statistical and practical significance. Grade differences in assertiveness and critical thinking were trivial (i.e., < .20 SD), but slightly larger for emotional control and empathy. While these developmental trends are undoubtedly important for future exploration and research, differences were nevertheless small in magnitude (i.e., < .50 SD), limiting their practical utility for MPS. For this reason and for the purpose of this dissertation, grade-level differences were deemed not practically significant, which led to the conclusion that on average, students in 4^{th}, 6^{th}, 8^{th}, and 10^{th} grades exhibited similar levels of assertiveness, critical thinking, emotional control, and empathy.

Correlation analyses. Correlations were then computed between the four social emotional constructs and ten background variables: gender, race/ethnicity, home language, free/reduced price lunch eligibility (FRL), homeless/highly mobile (HHM), total number of days enrolled in MPS during the 2015-2016 academic year (AY), MCA mathematics and reading growth between spring 2015 and spring 2016, total number of behavior infractions during AY 2015-2016, and total number of suspensions during AY

2015-2016. Results can be found in Table 8. Though most correlations were statistically significant due to the large sample size, fewer were of practical significance. Correlations were considered "practically significant" if they were equal to or greater than .10. This value was selected because correlations of this magnitude are typically considered to be "small" in psychological research, and the spread of correlations in Table 8 tended to range between .00 and .30. That is, correlations that were statistically significant but smaller than $r = .10$ (e.g., total days enrolled with assertiveness, $r = .03$, p, = .012) were considered not practically significant due to their near zero magnitude.

The correlations among assertiveness, critical thinking, emotional control, and empathy were all statistically significant, and tended to be the largest of those listed in Table 8. These mean score correlation coefficients are not identical to the factor correlation coefficients presented in Table 3 – the factor correlations use factor scores computed by weighting items – but both sets of correlations follow the same trends. Assertiveness was strongly correlated with critical thinking ($r = .52$, $p < .001$), moderately correlated with empathy ($r = .38$, $p < .001$), and weakly (and negatively) correlated with emotional control ($r = -.14$, $p < .001$). Critical thinking ($r = .10$, $p < .001$) and empathy ($r = .18$, $p < .001$) were also weakly correlated with emotional control, but these correlations were positive rather than negative, suggesting that greater emotional control was associated with greater empathy and critical thinking skills, but that more assertive students had less emotional control. Finally, critical thinking and empathy were strongly and positively related ($r = .57$, $p < .001$), indicating that students with greater critical thinking skills also tended to exhibit more empathy for others.

These social emotional constructs correlated with several background variables. Interestingly, following the cutoff of $r \geq .10$ stated above, assertiveness was not significantly correlated with any of the 10 background variables (i.e., gender, race/ethnicity, home language, FRL, HHM, total number of days enrolled in MPS, MCA mathematics and reading growth, total number of behavior infractions, and total number of suspensions). Critical thinking was only correlated with two background variables: FRL ($r = -.11$, $p < .001$), such that students who were eligible for FRL tended to have lower critical thinking skills; and MCA mathematics growth z-scores ($r = .12$, $p < .001$), such that greater critical thinking skills were modestly associated with more mathematics growth on the MCA between spring 2015 and spring 2016.

Emotional control and empathy were also associated with several background variables. Students who were male ($r = -.13$, $p < .001$), African American ($r = -.28$, $p < .001$), who spoke Somali at home ($r = -.11$, $p < .001$), who were eligible for FRL ($r = -.28$, $p < .001$), and/or who were HHM ($r = -.12$, $p < .001$) tended to score lower on emotional control than their counterparts, while students with higher GPAs ($r = .24$, $p < .001$), and who experienced greater growth on MCA mathematics ($r = .21$, $p < .001$) and reading ($r = .17$, $p < .001$) tests between 2015 and 2016 tended to score lower on emotional control. Similar patterns were found for empathy. Younger ($r = -.17$, $p < .001$), male ($r = -.19$, $p < .001$), African American ($r = -.18$, $p < .001$), and FRL eligible ($r = -.23$, $p < .001$) students tended to score lower on empathy than their counterparts, while students who experienced greater growth on the MCA in mathematics ($r = .15$, $p < .001$) and reading ($r = .11$, $p < .001$) had higher scores on empathy. Empathy was also related to total number of behavior infractions ($r = -.12$, $p < .001$) and suspensions ($r = -.12$, $p <$

.001), such that students with lower empathy scores had more disciplinary issues. As expected, student background variables were related to achievement and disciplinary variables, but because these relations are well-documented in the literature, they are not described in this section. Instead, a table and subsequent description of these relationships is available in Appendix B.

Table 8. Correlations between Social Emotional Competence and Background Variables

	1.	**2.**	**3.**	**4.**
1. Assertiveness	1			
2. Critical Thinking	.52***	1		
3. Emotional Control	-.14***	.10***	1	
4. Empathy	.38***	.57***	.18***	1
5. Age	-.04**	-.09***	.00	-.17***
6. Male	-.02	-.02	-.13***	-.19***
7. African American	.03**	-.06***	-.28***	-.18***
8. American Indian	-.01	-.05***	-.05***	-.06***
9. Asian	-.05***	-.01	.04**	-.03*
10. Hispanic	-.08***	-.03*	-.01	-.05***
11. Hmong HL	-.05***	-.01	-.04**	-.03**
12. Somali HL	.01	.02	-.11***	-.05***
13. Spanish HL	-.08***	-.03**	-.02	-.05***
14. Other HL	.00	.00	-.04**	.00
15. FRL	-.07***	-.011***	-.28***	-.23***
16. HHM	-.01	-.03*	-.12***	-.07***
17. Days Enrolled	.03*	.02	.08***	.07***
18. GPA	.04**	.08**	.24***	.14***
19. MCA Math Growth	.06***	.12**	.21***	.15***
20. MCA Reading Growth	.05**	.07**	.17***	.11***

	1.	2.	3.	4.
21. Behavior Infractions	-.06	-.08*	-.06*	-.12***
22. Total Suspensions	.03	-.03	-.09**	-.12***

Note. *$p < .05$, **$p < .01$, ***$p < .001$. Higher scores on assertiveness, critical thinking, emotional control, and empathy indicate greater skills. Correlations among background variables can be found in Appendix B.

In sum, correlation analyses found several practically and statistically significant relations between social emotional skills, achievement, discipline, and student background variables. As expected, the largest correlations were found among the four social emotional competencies (i.e., critical thinking and assertiveness, critical thinking and empathy, assertiveness and empathy), while smaller correlations were found between social emotional competence and background characteristics (e.g., FRL eligibility and critical thinking), academic achievement (e.g., GPA and emotional control), and school discipline (e.g., suspensions and empathy).

Research Question 1

Because scores on the HSA were hypothesized to vary across student background characteristics, correlations between the four subscales (i.e., assertiveness, critical thinking, emotional control, empathy) were further examined within the four background characteristics (i.e., gender, race/ethnicity, home language, and socioeconomic status) using the following technique. First, the correlation coefficients were transformed using Fisher's transformation: $z_r = ½ \log_e (1 + r) – ½ \log_e (1 – r)$. This was necessary, for when correlation coefficients are not near zero (e.g., $r = .80$), certain values (e.g., $r = .80$ to 1.00 vs. $r = 0.00$ to .20) are more likely than others, resulting in a skewed theoretical sampling distribution. Next, the standard error of the transformed correlation coefficient was computed: $s_{zr} = \frac{1}{\sqrt{N-3}}$ as was the 95% confidence interval: $z_r \pm 1.96 s_{zr}$. Confidence

intervals for each correlation coefficient were then compared between groups (e.g., assertiveness and critical thinking for males vs. females); correlation coefficients were considered not significantly different from one another when the confidence intervals overlapped. When confidence intervals did not overlap, Fisher's *r* to *z* test determined the statistical significance of these differences: $z = \frac{z_{r1} - z_{r2}}{\sqrt{\frac{1}{(N_1-3)} + \frac{1}{(N_2-3)}}}$ compared with a critical value of ± 1.96 (at $a = .05$; Ferguson, 1959). Rather than comparing all correlations using *r* to *z,* using confidence intervals minimized the number of significance tests. Results from these analyses are summarized below.

Gender

First, correlations between the four social emotional constructs were computed within gender. Results can be found in Table 9 below. Assertiveness, critical thinking, emotional control, and empathy were significantly correlated with one another among both males and females. Only one of these correlations was negative: assertiveness with emotional control ($r = -.12$, $p < .001$ for males; $r = -.17$, $p < .001$ for females), such that higher levels of assertiveness were associated with lower levels of emotional control.

Table 9. Intercorrelations between Social Emotional Constructs by Gender

	1.	**2.**	**3.**	**4.**
1. Assertiveness	1	.48***	-.17***	.32***
2. Critical Thinking	.57***	1	.14***	.54***
3. Emotional Control	-.12***	.07***	1	.24***
4. Empathy	.44***	.60***	.09***	1

Note. *$p < .05$, **$p < .01$, ***$p < .001$. Correlations below the diagonal are males only, while correlations above the diagonal are females only. $N_{Male} = 3281$; $N_{Female} = 3342$.

Next, Fisher's transformation (z_r) and the 95% confidence interval for z_r were calculated for both groups; these values are available in Table 10. The 95% confidence

interval only overlapped among assertiveness with emotional control, suggesting the relationship between these constructs was similar for male versus female students. Because the confidence intervals did not overlap among the remaining five correlation coefficients, Fisher's *r* to *z* was used to test the significance of these differences. This required five significance tests, so Bonferroni's correction was applied (α = .05/5 tests) to decrease the likelihood of a Type I error, setting α = .01.

Table 10. Z_r and 95% Confidence Intervals by Gender

	1.	**2.**	**3.**	**4.**
1. Assertiveness	1	.52 [.49, .55]	-.17 [-.20, -.14]	.33 [.30, 36]
2. Critical Thinking	.65 [.62, .68]	1	.14 [.11, .17]	.60 [.57, .63]
3. Emotional Control	-.12 [-.15, -.09]	.07 [.04, .10]	1	.24 [.21, .27]
4. Empathy	.47 [.44, .50]	.69 [.66, .72]	.09 [.06, .12]	1

Note. SE_{zr} = .02 for all six correlations. Z_r below the diagonal are males only, while Z_r above the diagonal are females only.

All five correlations were significantly different for male versus female students: assertiveness with critical thinking [$z = 5.22$, $p < .001$]; assertiveness with empathy [$z = 5.89$, $p < .001$]; critical thinking with emotional control [$z = 2.96$, $p < .01$]; critical thinking with empathy [$z = 3.51$, $p < .001$]; and emotional control with empathy [$z = 6.23$, $p < .001$]. The relationships between assertiveness and critical thinking, assertiveness and empathy, and critical thinking and empathy were significantly stronger for males as compared to females, while the relationships between critical thinking and emotional control as well as empathy and emotional control were stronger for females. As previously mentioned, the relationship between assertiveness and emotional control was no different for males than females.

Race/Ethnicity

Correlations were then computed within each of the five racial/ethnic groups (White, African American, American Indian, Asian, and Hispanic); results are available in Table 11. Of the 30 correlations listed below, 6 were either statistically ($p > .05$) or practically ($r < .10$) non-significant: emotional control with empathy for African American, American Indian, and Hispanic students, and critical thinking with emotional control for African American, American Indian, and Asian students.

Table 11. Intercorrelations between Social Emotional Constructs by Race/Ethnicity

White				**African American**			
	1.	**2.**	**3.**		**1.**	**2.**	**3.**
1. Assertiveness	1			**1. Assertiveness**	1		
2. Critical Thinking	.49**	1		**2. Critical Thinking**	.53***	1	
3. Emotional Control	-.11**	.15**	1	**3. Emotional Control**	-.18***	.05*	1
4. Empathy	.32**	.53**	.23**	**4. Empathy**	.41***	.60***	.04
American Indian				**Asian**			
	1.	**2.**	**3.**		**1.**	**2.**	**3.**
1. Assertiveness	1			**1. Assertiveness**	1		
2. Critical Thinking	.55***	1		**2. Critical Thinking**	.56***	1	
3. Emotional Control	-.26**	-.06	1	**3. Emotional Control**	-.13**	.09*	1
4. Empathy	.40***	.56***	.10	**4. Empathy**	.40***	.48***	.11*
Hispanic				**Overall**			
	1.	**2.**	**3.**		**1.**	**2.**	**3.**
1. Assertiveness	1			**1. Assertiveness**	1		
2. Critical Thinking	.55***	1		**2. Critical Thinking**	.52***	1	
3. Emotional Control	-.18***	.02	1	**3. Emotional Control**	-.14***	.10***	1
4. Empathy	.45***	.57***	.08*	**4. Empathy**	.38***	.57***	.18***

Note. *$p < .05$, **$p < .01$, ***$p < .001$. $N_{White} = 2697$; $N_{AfricanAmerican} = 2135$; $N_{AmericanIndian} = 168$; $N_{Asian} = 538$; $N_{Hispanic} = 1085$.

Fisher's transformation (z_r) and the 95% confidence interval for z_r are available in Table 12. A total of 60 comparisons were made using the 95% confidence interval, which found 10 non-overlapping pairs of correlations. Those included assertiveness with empathy for White vs. African American students and White vs. Hispanic students; critical thinking with emotional control for White vs. African American students, White vs. American Indian students, and White vs. Hispanic students; critical thinking with empathy for White vs. African American students and African American vs. Asian students; and emotional control with empathy for White vs. African American students, White vs. Asian students, and White vs. Hispanic students. Fisher's *r* to *z* was used to test whether these ten pairs of correlations were significantly different from one another. Since this required ten significance tests, Bonferroni's correction was applied (α = .05/10 tests), setting the significance level at α = .005.

Nine of the ten pairs were significantly different from one another: assertiveness with empathy for White vs. African American students [z = -4.46, p < .001] and White vs. Hispanic students [z = -5.00, p < .001]; critical thinking with emotional control for White vs. African American students [z = 3.48, p < .001] and White vs. Hispanic students [z = 3.64, p < .001]; critical thinking with empathy for White vs. African American students [z = -6.53, p < .001] and African American vs. Asian students [z = 6.01, p < .001]; and emotional control with empathy for White vs. African American students [z = 7.05, p < .001], White vs. Asian students [z = 2.84, p = .005], and White vs. Hispanic students [z = 4.57, p < .001]. One pair of correlations, critical thinking with emotional control for White vs. American Indian students, did not find statistically significant results [z = 2.63, p = .009], suggesting that the relationship between critical thinking and

emotional control was similar for White versus American Indian students, despite their non-overlapping confidence interval.

Table 12. Z_r and 95% Confidence Intervals by Race/Ethnicity

White			
	1.	**2.**	**3.**
1. Assertiveness	1		
2. Critical Thinking	.54 [.50, .58]	1	
3. Emotional Control	-.11 [-.15, -.07]	.15 [.11, .19]	1
4. Empathy	.33 [.29, .37]	.59 [.55, .63]	.24 [.20, .28]

African American			
	1.	**2.**	**3.**
1. Assertiveness	1		
2. Critical Thinking	.59 [.55, .63]	1	
3. Emotional Control	-.19 [-.23, -.15]	.05 [.01, .09]	1
4. Empathy	.44 [.40, .48]	.70 [.66, .74]	.04 [.00, .08]

American Indian			
	1.	**2.**	**3.**
1. Assertiveness	1		
2. Critical Thinking	.62 [.46, .78]	1	
3. Emotional Control	-.26 [-.42, -.10]	-.06 [-.22, .10]	1
4. Empathy	.42 [.26, .58]	.63 [.47, .79]	.10 [-.06, .26]

Asian			
	1.	**2.**	**3.**
1. Assertiveness	1		
2. Critical Thinking	.63 [.55, .71]	1	
3. Emotional Control	-.13 [-.21, -.05]	.09 [.01, .17]	1
4. Empathy	.43 [.35, .51]	.52 [.44, .60]	.11 [.03, .19]

Hispanic			
	1.	**2.**	**3.**
1. Assertiveness	1		
2. Critical Thinking	.62 [.56, .68]	1	
3. Emotional Control	-.18 [-.24, -.12]	.02 [-.04, .08]	1
4. Empathy	.48 [.42, .54]	.65 [.59, .71]	.08 [.02, .14]

Note. N_{White} = 2697, SE_{White} = .02; $N_{AfricanAmerican}$ = 2135, $SE_{AfricanAmerican}$ = .02; $N_{AmericanIndian}$ = 168, $SE_{AmericanIndian}$ = .08; N_{Asian} = 538, SE_{Asian} = .04; $N_{Hispanic}$ = 1085; $SE_{Hispanic}$ = .03.

These analyses suggest that the relationships between the four social emotional competencies were similar for White, African American, American Indian, Asian, and Hispanic students, but with a few exceptions. First, the relationship between assertiveness and empathy was stronger for both African American and Hispanic students as compared to White students. The opposite was true for critical thinking and emotional control, such

that these constructs were more strongly related among White students versus both African American and Hispanic students. Finally, the correlation coefficient for critical thinking and empathy was significantly larger for African American as compared to White and Asian students, while the relationship between emotional control and empathy was significantly stronger for White students as compared to Asian and Hispanic students.

Home Language

Next, correlations were computed within the five home language categories: English, Hmong, Somali, Spanish, and other/unknown (see Table 13). Following standards described above, four sets of correlations – assertiveness with critical thinking, assertiveness with emotional control, assertiveness with empathy, and critical thinking with empathy – were practically and statistically significant for all five home language groups. Interestingly, however, the correlation between critical thinking and emotional control was only significant for English-speaking students, and the correlation between empathy and emotional control was only significant for English- and Spanish-speaking students.

Fisher's transformation (z_r) and the 95% confidence interval for z_r are available in Table 14. A total of 60 comparisons were made using the 95% confidence interval, which found 12 non-overlapping pairs of correlations. Those included: assertiveness with critical thinking for English- vs. Hmong-speakers and English- versus Somali-speakers; assertiveness with empathy for English- versus Hmong-speakers, English- versus Somali-speakers, English- versus Spanish-speakers, and English- versus other language-speakers; critical thinking with emotional control for English- versus Spanish-speakers; critical

thinking with empathy for English- versus Somali-speakers; and emotional control with empathy for English- versus Hmong-speakers, English- versus Somali-speakers, English- versus Spanish-speakers, and English- versus other language-speakers. Fisher's *r* to *z* was used to test whether these 12 pairs of correlations were significantly different from one another. Since this required 12 significance tests, Bonferroni's correction was applied (α = .05/12 tests), setting the significance level at α = .004.

Table 13. Intercorrelations between Social Emotional Constructs by Home Language

English				**Hmong**			
	1.	**2.**	**3.**		**1.**	**2.**	**3.**
1. Assertiveness	1			**1. Assertiveness**	1		
2. Critical Thinking	.50***	1		**2. Critical Thinking**	.63***	1	
3. Emotional Control	-.13***	.13***	1	**3. Emotional Control**	-.20**	.02	1
4. Empathy	.33***	.55***	.23***	**4. Empathy**	.49***	.53***	.02
Somali				**Spanish**			
	1.	**2.**	**3.**		**1.**	**2.**	**3.**
1. Assertiveness	1			**1. Assertiveness**	1		
2. Critical Thinking	.60***	1		**2. Critical Thinking**	.54***	1	
3. Emotional Control	-.18***	.06	1	**3. Emotional Control**	-.19***	.03	1
4. Empathy	.51***	.65***	.05	**4. Empathy**	.43***	.57***	.11**
Other/Unknown				**Overall**			
	1.	**2.**	**3.**		**1.**	**2.**	**3.**
1. Assertiveness	1			**1. Assertiveness**	1		
2. Critical Thinking	.54***	1		**2. Critical Thinking**	.52***	1	
3. Emotional Control	-.17*	.05	1	**3. Emotional Control**	-.14***	.10***	1
4. Empathy	.50***	.61***	.04	**4. Empathy**	.38***	.57***	.18***

Note. **p* < .05, ***p* < .01, ****p* < .001. $N_{English}$ = 4534; N_{Hmong} = 238; N_{Somali} = 699; $N_{Spanish}$ = 924; N_{Other} = 228.

Ten of the twelve pairs were significantly different from one another: assertiveness with critical thinking for English- versus Hmong-speakers [*z* = -4.96, *p* <

.001] and English- versus Somali-speakers [z = -6.10, p < .001]; assertiveness with empathy for English- versus Hmong-speakers [z = -3.74, p < .001], English- versus Somali-speakers [z = -7.20, p < .001], English- versus Spanish-speakers [z = -3.96, p < .001], and English- versus other language-speakers [z = -3.65, p < .001]; critical thinking with empathy for English- versus Somali-speakers [z = -7.24, p < .001]; and emotional control with empathy for English- versus Hmong-speakers [z = 3.20, p = .001], English- versus Somali-speakers [z = 4.51, p < .001] and English- versus Spanish-speakers [z = 3.42, p < .001]. Fisher's r to z did not find significant results for critical thinking with empathy among English- versus Spanish-speakers [z = 2.78, p = .006] or emotional control with empathy among English- versus other language-speakers [z = 2.83, p = .005].

In sum, although intercorrelations between the social emotional competencies were similar among students who spoke Hmong, Somali, Spanish, and other/unknown languages at home, they tended to be weaker among English-speaking students. More specifically, the relationship between assertiveness and empathy was significantly weaker among English-speaking students as compared to the remaining four home language groups, and the relationship between emotional control and empathy was weaker for English-speaking students as compared to Hmong-, Somali-, Spanish-speaking students. The relationship between assertiveness and critical thinking was also weaker for English-speaking students versus both Hmong- and Somali-speaking students. Finally, the correlation between critical thinking and empathy was significantly smaller among English-speaking versus Somali-speaking students.

Table 14. Z_r and SE by Home Language

English				Hmong			
	1.	**2.**	**3.**		**1.**	**2.**	**3.**
1. Assertiveness	1			**1. Assertiveness**	1		
2. Critical Thinking	.55 [.52, .58]	1		**2. Critical Thinking**	.74 [.61, .87]	1	
3. Emotional Control	-.13 [-.16, -.10]	.13 [.10, .16]	1	**3. Emotional Control**	-.20 [-.33, -.07]	.02 [-.11, .15]	1
4. Empathy	.34 [.31, .37]	.62 [.59, .65]	.23 [.20, .26]	**4. Empathy**	.54 [.41, .67]	.59 [.46, .72]	.02 [-.11, .15]
Somali				**Spanish**			
	1.	**2.**	**3.**		**1.**	**2.**	**3.**
1. Assertiveness	1			**1. Assertiveness**	1		
2. Critical Thinking	.70 [.63, .77]	1		**2. Critical Thinking**	.60 [.54, .66]	1	
3. Emotional Control	-.18 [-.25, -.11]	.06 [-.01, .13]	1	**3. Emotional Control**	-.20 [-.26, -.14]	.03 [-.03, .09]	1
4. Empathy	.57 [.50, .64]	.77 [.70, .84]	.05 [-.02, .12]	**4. Empathy**	.46[.40, .52]	.65[.59, .71]	.11 [.05, .17]
Other/Unknown							
	1.	**2.**	**3.**				
1. Assertiveness	1						
2. Critical Thinking	.61 [.48, .74]	1					
3. Emotional Control	-.17 [-.30, -.04]	.05[-.08, .18]	1				
4. Empathy	.54 [.41, .67]	.70 [.57, .83]	.04 [-.09, .17]				

Note. $N_{English}$ = 4534, $SE_{English}$ = .02; N_{Hmong} = 238, SE_{Hmong} = .07; N_{Somali} = 699, SE_{Somali} = .04; $N_{Spanish}$ = 924, $SE_{Spanish}$ = .03; N_{Other} = 228, SE_{Other} = .07.

Socioeconomic Status

FRL eligibility served as a proxy for socioeconomic status, and was coded as eligible (1) or not eligible (0). Correlations can be found in Table 15. Only one correlation did not find statistically significant results (emotional control with critical thinking among FRL eligible students; r = .03, p = .074), and two correlations did not meet standards for practical significance (emotional control with empathy for FRL eligible students, r = .07, p < .001; emotional control with assertiveness for non-eligible students, r = -.09, p < .001).

Table 15. Intercorrelations between Social Emotional Constructs by FRL Eligibility

	1.	**2.**	**3.**	**4.**
1. Assertiveness	1	.49***	-.09***	.32***
2. Critical Thinking	.54***	1	.15***	.51***
3. Emotional Control	-.22***	.03	1	.23***
4. Empathy	.41***	.59***	.07***	1

Note. $*p < .05$, $**p < .01$. Correlations below the diagonal are FRL eligible students only, while correlations above the diagonal are not FRL eligible. $N_{FRL} = 3734$; $N_{Not\text{-}FRL} = 2889$.

Fisher's transformation (z_r) and the 95% confidence interval for z_r are available in Table 16. The 95% confidence interval was overlapping for only one pair of correlations (assertiveness with critical thinking), suggesting the relationship between assertiveness and critical thinking was similar for FRL eligible and non-eligible students. Fisher's *r* to *z* was used to test the significance of the differences among the remaining five correlations. Since this required five significance tests, Bonferroni's correction was applied ($\alpha = .05/5$ tests), setting $\alpha = .01$.

Fisher's *r* to *z* found statistically significant results for all five pairs of correlations: assertiveness with emotional control [$z = -5.12$ $p < .001$]; assertiveness with empathy [$z = 4.04$, $p < .001$]; critical thinking with empathy [$z = 4.45$, $p < .001$]; emotional control with critical thinking [$z = -5.08$, $p < .001$]; and emotional control with empathy [$z = -6.73$, $p < .001$]. The relationship between assertiveness and emotional control, assertiveness and empathy, and critical thinking and empathy was significantly stronger for FRL eligible students, while the relationship between critical thinking and emotional control as well as emotional control and empathy was stronger for non-eligible students. As stated above, the relationship between assertiveness and critical thinking was no different for FRL eligible versus non-eligible students.

Table 16. Z_r and 95% Confidence Intervals by FRL Eligibility

	1.	2.	3.	4.
1. Assertiveness	1	.54 [.50, .58]	-.09 [-.13, -.05]	.33 [.29, .37]
2. Critical Thinking	.60 [.57, .63]	1	.16 [.12, .20]	.56 [.52, .60]
3. Emotional Control	-.22 [-.25, -.19]	.03 [.00, .06]	1	.24 [.20, .28]
4. Empathy	.43 [.40, .46]	.67 [.64, .70]	.07 [.04, .10]	1

Note. SE_{zr} = .02 for all six correlations. Z_r below the diagonal are FRL eligible students only, while Z_r above the diagonal are not FRL eligible.

In sum, these analyses found some evidence of invariance for all six of the intercorrelations among the four social emotional competencies. Said differently, these analyses suggest that the pattern of relationships among the social emotional skills varied in strength across background characteristics. Three correlations found some evidence of invariance across all four background characteristics – assertiveness with empathy, critical thinking with empathy, and emotional control with empathy – while one correlation, critical thinking with emotional control, varied across three background characteristics (gender, race/ethnicity, socioeconomic status). The relationship between assertiveness and critical thinking varied among two background characteristics (gender and home language), and the relationship between assertiveness and emotional control only varied by one background characteristic (socioeconomic status).

Research Question 2

The second research question aimed to determine the extent to which students' backgrounds (i.e., gender, racial/ethnic groups, home languages, and socioeconomic status) predicted their level of social emotional competence using multiple regression analyses. Because this study's large sample could detect very small effects, all results were required to meet standards of practical significance. Relations were considered practically and statistically significant if they were moderate to large in magnitude per

Cohen's (1988) conventions (small: $R^2 \leq .02$, medium: $R^2 \leq .13$, large: $R^2 \leq .26$). That is, the regression analyses below were deemed not meaningful if students' background had a small relation with competence (e.g., $R^2 < .13$).

Assertiveness

The first set of regression analyses included gender, race/ethnicity, home language, and socioeconomic status as independent variables, and assertiveness as the dependent variable. Scores on assertiveness ranged from 1 to 4, with higher scores indicating more assertiveness.

This regression model was first fit to the sample's fourth-grade students. An F-test [$F(10, 2044) = 2.86$, $p = .002$] found that students' background characteristics predicted their level of assertiveness. However, the four variables explained less than 1% of the variance in assertiveness (adjusted $R^2 = .009$), a value deemed of little practical significance by the standards described above. Therefore, for the purposes of this study, fourth-graders' background characteristics – as defined by their gender, race/ethnicity, home language, and socioeconomic status – had no practical relation with their level of assertiveness. These findings were replicated among sixth-, eighth-, and tenth-grade students: sixth grade [$F(10, 1681) = 5.81$, $p < .001$, adjusted $R^2 = .028$]; eighth grade [$F(10, 1512) = 3.10$, $p = .001$, adjusted $R^2 = .014$]; tenth grade [$F(10, 1218) = 0.90$, $p = .535$, adjusted $R^2 = -.001$]. Of those, sixth grade adjusted R^2 was the largest, at about 3% of the variance, but even that was relatively small. Consequently, it was concluded that assertiveness was independent of background characteristics for all students (see Appendix C for a summary of regression results).

Critical Thinking

The next set of multivariate linear regression models included the same four predictors as independent variables (i.e., gender, race/ethnicity, home language, socioeconomic status), but critical thinking as the dependent variable. Scores on critical thinking ranged from 1 to 4, with higher scores indicating greater critical thinking skills.

First, the regression model was fit to fourth-grade students only. An F-test found statistically significant results [$F(10, 2043) = 5.45$, $p < .001$], but the relations with background variables were small, explaining only 2.1% of the variance in critical thinking skill. These findings were replicated among sixth- [$F(10, 1678) = 3.95$, $p < .001$, adjusted $R^2 = .017$], eighth- [$F(10, 1508) = 4.29$, $p < .001$, adjusted $R^2 = .021$], and tenth-graders [$F(10, 1218) = 3.14$, $p = .001$, adjusted $R^2 = .017$]. Hence, it was concluded that students' critical thinking skill was not a function of their background characteristics, including gender, race/ethnicity, home language, or socioeconomic status (see Appendix C for a summary of regression results).

Emotional Control

Next, students' background characteristics served as predictors of emotional control. Scores on emotional control ranged from 1 to 4, with higher scores indicating greater emotional control.

Grade 4. First, the regression model was fit to fourth-grade students. Significant results from an F-test [$F(10, 2041) = 42.36$, $p < .001$] suggested that students' background characteristics were related to their level of emotional control. As indicated by the adjusted R^2, the relationship was moderate in magnitude, with student background explaining 16.8% of the variance in emotional control.

A summary of regression results can be found in Table 17. All four of the background variables predicted emotional control. More specifically, male, African American, American Indian, Hispanic, and FRL eligible students scored an average of .26, .52, .26, .21, and .33 points lower on emotional control than their female, White, and non-FRL eligible counterparts, respectively. Interestingly, however, Somali-speaking students scored an average of .19 points higher on emotional control than English-speaking students. Asian (as compared to White) race/ethnicity and Hmong, Spanish, and other/unknown (as compared to English) home language had no relation with emotional control.

Table 17. Regression Analysis Summary for Student Background Predicting Emotional Control: 4th Grade

	B	**SE *B***	***β***	***t***	***p***
Male	-.26	.04	-.15	-7.45	.000
African American	-.52	.06	-.28	-8.83	.000
American Indian	-.26	.11	-.05	-2.25	.025
Asian	-.07	.10	-.02	-.69	.491
Hispanic	-.21	.08	-.09	-2.80	.005
FRL	-.33	.05	-.19	-6.33	.000
Hmong Home Language	-.19	.14	-.04	-1.29	.197
Somali Home Language	.19	.07	.06	2.70	.007
Spanish Home Language	.15	.08	.06	1.84	.066
Other Home Language	.09	.12	.02	.74	.458

Note. Adjusted R^2 = .168, N = 2052

I then proceeded to model checking, examining the five assumptions underlying regression analyses: normality, linearity, homoscedasticity, independence, and fixed x. Independence and fixed x can be reasonably assumed through proper survey administration and accurate data collection, respectively. Normality was assessed by

examining a histogram of residuals, which resembled a normal distribution (M = 0.00, SD = 0.64), and examining a Q-Q plot, which also raised no cause for concern. Homoscedasticity was tested by visually examining a plot of residuals against the predicted values. This plot found no discernible or concerning pattern, which suggested that the error variance was homoscedastic. Finally, linearity was assumed because the independent variables were categorical rather than continuous.

In sum, this regression model found that student background characteristics had a moderate relation with emotional control, explaining nearly 17% of the variance. More specifically, African American, American Indian, Hispanic, FRL eligible, and male students scored lower on emotional control than their White, non-FRL eligible, and male counterparts, while Somali-speaking students scored higher than English-speaking students.

Grade 6. Next, the regression model was replicated among sixth-graders. The F-test found statistically significant results [$F(10, 1676) = 27.75$, $p < .001$], suggesting that students' scores on emotional control were, in part, a function of their background characteristics. Per Cohen's (1988) conventions, background characteristics – including gender, race/ethnicity, home language, and socioeconomic status – had a moderate-sized relationship with emotional control, explaining 13.7% of the variance.

A summary of regression results can be found in Table 18. Again, all four background variables predicted emotional control. On average, African American and American Indian students scored .38 and .52 points lower than White students, and males and FRL eligible students scored an average of .22 and .30 points lower than females and non-eligible students, respectively. Home language was the only variable that positively

predicted emotional control, such that Hmong-speaking students scored an average of .40 points higher than English-speakers. Asian and Hispanic race/ethnicity, as well as Somali, Spanish, and other/unknown home language had no measurable relation with emotional control.

Table 18. Regression Analysis Summary for Student Background Predicting Emotional Control: 6th Grade

	B	***SE B***	***β***	***t***	***p***
Male	-.22	.04	-.13	-5.89	.000
African American	-.38	.06	-.21	-6.04	.000
American Indian	-.52	.14	-.09	-3.85	.000
Asian	-.08	.09	-.03	-.86	.390
Hispanic	-.08	.10	-.04	-.81	.417
FRL	-.30	.06	-.18	-5.55	.000
Hmong Home Language	.40	.14	.08	2.90	.004
Somali Home Language	.05	.07	.02	.75	.453
Spanish Home Language	.01	.11	.01	.11	.912
Other Home Language	-.01	.11	.00	-.09	.931

Note. Adjusted R^2 = .137, N = 1687

Next, model assumptions were tested. Linearity, independence, and fixed x were considered met for reasons described above (see "Grade 4" subsection). An examination of a histogram of the residuals (M = 0.00, SD = 0.77) and Q-Q plot suggested that the residuals were normally distributed. Homoscedasticity was tested by visually examining a plot of residuals against the predicted values. This plot found no discernible or concerning pattern, which suggested that the error variance was homoscedastic.

Overall, this analysis suggested that students' scores on emotional control were, in part, a function of their background characteristics, which explained nearly 14% of the variance. More specifically, male, African American, American Indian, and FRL eligible

students tended to score lower on emotional control than their female, White, and non-FRL eligible counterparts, while Hmong-speaking students tended to score higher on emotional control than English-speaking students.

Grade 8. The regression was then fit to the sample's eighth-grade students. Statistically significant results from an F-test [$F(10, 1502) = 20.90$, $p < .001$] and the adjusted R^2 suggested that student background had a small relationship with emotional control, explaining 11.6% of the variance. Although this did not meet standards for practical significance (i.e., $R^2 \geq .13$), results are described below because these relations approached practical significance, and when taken into consideration with both statistically and practically significant relations among fourth- and sixth-graders, these findings likely have practical value for MPS.

Table 19. Regression Analysis Summary for Student Background Predicting Emotional Control: 8th Grade

	B	***SE B***	***β***	***t***	***p***
Male	-.19	.04	-.12	-4.75	.000
African American	-.39	.06	-.23	-6.15	.000
American Indian	-.24	.12	-.05	-2.00	.045
Asian	-.07	.10	-.02	-.70	.485
Hispanic	-.21	.12	-.10	-1.80	.072
FRL	-.27	.06	-.17	-4.88	.000
Hmong Home Language	.05	.15	.01	.35	.729
Somali Home Language	.04	.07	.01	.48	.630
Spanish Home Language	.16	.13	.07	1.24	.216
Other Home Language	.06	.10	.01	.55	.582

Note. Adjusted $R^2 = .116$, $N = 1513$

A summary of regression results is available in Table 19. This time, only three background variables (negatively) predicted emotional control: gender, race/ethnicity,

and FRL eligibility. African American and American Indian students scored an average of .39 and .24 points lower on emotional control than White students, respectively. Males scored an average of .19 points lower than females, and FRL eligible students scored .27 points lower than non-eligible students. Neither Asian or Hispanic race/ethnicity nor home language were predictive of students' emotional control.

Model assumptions were tested. Linearity, independence, and fixed x were considered met for reasons described above (see "Grade 4" subsection). An examination of a histogram of the residuals ($M = 0.00$, $SD = 0.75$) and Q-Q plot suggested that the residuals were normally distributed. Homoscedasticity was tested by visually examining a plot of residuals against the predicted values. This plot found no discernible or concerning pattern, which suggested that the error variance was homoscedastic.

Overall, this regression analysis found that emotional control was, in part, a function of students' background characteristics, which explained nearly 12% of the variance. On average, male, African American, American Indian, and FRL eligible students scored lower than their female, White, and non-FRL eligible counterparts. Unlike the fourth- and sixth-grade models, however, home language did not predict emotional control, suggesting that eighth-grade students had similar levels of emotional control, regardless of their home language.

Grade 10. The regression was replicated one last time among tenth-grade students. Again, statistically significant results from an F-test [$F(10, 1217) = 13.44$, $p < .001$] and the adjusted R^2 suggested that the relation between tenth-graders' background characteristics and their levels of emotional control was small in magnitude, with background variables explaining 9.2% of the variance in emotional control. Because

these results did not meet standards for practical significance, they will not be described in greater detail in this section. A summary of results is available in Appendix C.

Developmental trends. Although students' background characteristics – including gender, race/ethnicity, home language, and socioeconomic status – predicted their scores on emotional control in both fourth and sixth grade, by eighth and tenth grade, these relations were smaller in magnitude. In fourth grade, student background explained over 17% of the variance in emotional control, but by tenth grade, background only explained 9% of the variance.

Gender, race/ethnicity, and FRL eligibility predicted lower scores on emotional control in fourth, sixth, and eighth grade. More specifically, male, African American, American Indian, and FRL-eligible students scored lower than female, White, and non-eligible students, respectively. In fourth grade, Somali-speaking students scored higher on emotional control than students who spoke English at home; in sixth grade, Hmong-speaking students outscored their English-speaking counterparts; and in eighth grade, home language had no relation with emotional control. Finally, Hispanic race/ethnicity only predicted emotional control in fourth grade, and American Indian race/ethnicity only predicted emotional control in eighth grade.

Empathy

The final set of regression analyses predicted students' empathy from their background characteristics, including gender, race/ethnicity, home language, and socioeconomic status. Scores on empathy ranged from 1 to 4, with higher scores indicating more empathy.

The first regression model was fit only to fourth-grade students. An F-test found statistically significant results [$F(10, 2045) = 22.60$, $p < .001$], suggesting that fourth-graders' backgrounds were predictive of their level of empathy. Per Cohen's (1988) standards, this relationship was small in magnitude, with student background explaining 9.5% of the variance in empathy. These findings were replicated among sixth- [$F(10, 1679) = 22.94$, $p < .001$, adjusted $R^2 = .12$], eighth- [$F(10, 1510) = 20.66$, $p < .001$, adjusted $R^2 = .12$], and tenth-graders [$F(10, 1218) = 17.23$, $p < .001$, adjusted $R^2 = .12$], suggesting that students' backgrounds were only modestly related to their level of empathy (see Appendix C for a summary of regression results). Thus, it was concluded that empathy was largely independent of student background characteristics.

Summary

These analyses examined the predictive value of student background characteristics for social emotional competence. Given the large sample size, relations were only considered to be of practical significance if they were moderate to large in magnitude, as determined by Cohen's (1988) conventions (i.e., $R^2 \geq .13$). Though background variables were statistically significant predictors of all four social emotional competencies, most of these relations were small in magnitude. Students' backgrounds explained between 1% and 12% of the variance in assertiveness, critical thinking, and empathy. These same variables explained a moderate amount of the variance – between 14% and 17% – in emotional control, but only among fourth- and sixth-graders. By eighth and tenth grades, the relation between background variables and emotional control was small in magnitude, with background variables explaining only 9% and 12% of the variance, respectively.

Findings were somewhat consistent across fourth, sixth, and eighth grades, with male, African American, American Indian, and FRL eligible students tending to score lower on emotional control in both grades. In fourth grade, Hispanic students also scored lower on emotional control than their White counterparts, while Somali-speaking students scored higher than English-speakers. By sixth grade, however, Hmong-speaking students scored higher than English-speakers, but there were no relations with Hispanic race/ethnicity or Somali home language. Finally, in eighth grade, American Indian students scored lower on empathy than their White peers, and home language no longer predicted emotional control. These findings argue against combining across group for analyses, for what looks like social emotional effects could just be reflecting student background (or cultural) differences.

Research Question 3

The third research question utilized Hierarchical Linear Modeling (HLM) to determine: (1) the extent to which social emotional competence, as measured by the HSA, predicted student achievement, as measured by the Minnesota Comprehensive Assessment (MCA), and (2) whether the relationship between social emotional competence and achievement was invariant across background characteristics.

Mathematics

The first model included students' growth z-scores, calculated between spring 2015 and spring 2016, on the mathematics subtest of the MCA (see Chapter 3 for an explanation of this approach). Because the sample did not include enough clusters (i.e., schools) to justify HLMs within each grade, these models were conducted across grades, with grade included as a level 1 covariate in the model. Mathematics growth z-scores

were available for 4,379 students (66.1%) in 42 schools (87.5%); as expected, students' scores followed a normal distribution (M = .08, SD = 1.03). Of the 2,244 (33.9%) students from 6 schools (12.5%) who were missing MCA mathematics growth scores, 1,321 (58.9%) were in grades 9 -12. Because the mathematics subtest of the MCA is only administered in grades 3-8 and again in grade 11, these missing values were expected.

Table 20. Students with (Complete) vs. without (Missing) Mathematics Growth Z-scores

	Complete (N = 4,379)	**Missing (N = 923)**	
	N (%)	**N (%)**	**χ^2 (df)**
Gender			
Female	2209 (82.1)	483 (17.9)	1.08 (1)
Male	2170 (83.1)	440 (16.9)	
Ethnicity			
African American	1272 (74.2)	443 (25.8)	130.45*** (4)
American Indian	117 (80.7)	28 (19.3)	
Asian	329 (85.9)	54 (14.1)	
Hispanic	743 (85.7)	124 (14.3)	
White	1918 (87.5)	274 (12.5)	
Home Language			
Hmong	141 (92.2)	12 (7.8)	40.56*** (4)
Somali	416 (77.5)	121 (22.5)	
Spanish	648 (88.2)	87 (11.8)	
Other/Unknown	133 (76.4)	41 (23.6)	
English	3041 (82.1)	662 (17.9)	
FRL Eligible	2367 (79.3)	618 (20.7)	51.58*** (1)
HHM	140 (51.1)	134 (48.9)	199.35*** (1)
Special Education	414 (77.0)	124 (23.0)	13.25*** (1)
Gifted/Talented	916 (89.9)	103 (10.1)	46.763*** (1)
Grade			
4	1759 (85.4)	300 (14.6)	17.95*** (2)
5[a]	9 (81.8)	2 (18.2)	
6	1364 (80.6)	328 (19.4)	
7[a]	8 (50.0)	8 (50.0)	
8	1239 (81.3)	285 (18.7)	
	M (SD)	***M (SD)***	***t* (df)**
Days Enrolled	175.09 (8.84)	154.49 (41.38)	28.88*** (5300)

Note. *p < 0.05, **p < .01, ***p < .001. [a] indicates dropped from the chi-square analysis due to small sample size. Maximum number of enrolled days = 176.

The remaining 923 students (41.4% of missing cases) were missing growth scores for unknown reasons (e.g., transferred in the district during the 2015-2016 AY), so chi-square analyses were conducted to compare these students with the 4,379 students who had outcome data to determine whether these groups were systematically different. Results can be found in Table 20. These analyses found some important differences between groups. White, Somali-speaking, Spanish-speaking, FRL eligible, special education, and gifted/talented students were slightly overrepresented in the sample, while African American students were underrepresented. Findings from the subsequent analysis should be applied carefully to these groups.

I then proceeded to the HLM, which involved several steps. First, a fully unconditional model ensured multi-level modeling was the most appropriate approach by testing how much variation in student mathematics growth was due to the school they attended. Statistically speaking, the fully unconditional model tested whether the cluster variance was equal to zero ($H_0 = \tau_{00}$; equivalent to a one-way random effects ANOVA), and was as follows: $Y_{ij} = \gamma_{00} + u_{0j} + r_{ij}$, where Y_{ij} = the i^{th} student in j^{th} cluster's MCA reading growth z-score, γ_{00} = grand mean MCA mathematics growth z-score score, u_{0j} = level 2 error (unexplained school-level variance), r_{ij} = level 1 error (unexplained student-level variance). As suspected, students' mathematics growth was due, in part, to school, which explained 11.1% (ρ = .1106) of the variance in student growth. This is greater than ρ = .05, the cutoff at which HLM is deemed necessary to account for dependency in the outcome variable. This rule of thumb is commonly used in HLM (Raudenbush & Bryk, 2002).

Next, I used the Optimal Design Software (Raudenbush et al., 2011) to set alpha and power for the HLM using characteristics of the sample. With α = .05, 42 clusters (i.e., schools), an average sample size of 135 students per school, and an intraclass correlation coefficient (ICC; ρ) of .11, this model could detect an effect of .46 SD with .99 power, .39 SD with .95 power, .35 SD with .90 power, .32 SD with .85 power, and .30 SD with .80 power. Per the norm in educational psychology, power was set at .85, allowing me to detect an effect ≥ .32 SD.

The relationship between social emotional competence and mathematics achievement was modeled in three additional steps: (1) the control model, (2) the social emotional competence model, and (3) the cultural variation model. The control model included demographic and background variables traditionally related to student achievement, including grade, gender (coded as male = 1, female = 0), race/ethnicity (i.e., African American, American Indian, Asian, Hispanic, White; dummy coded [1,0], with White serving as the reference group), home language (i.e., English, Hmong, Somali, Spanish, other/unknown; dummy coded [1,0], with English serving as the reference group), free/reduced price lunch (FRL) eligibility (coded as 1 = eligible, 0 = not eligible), gifted/talented (coded as 1 = gifted/talented, 0 = not gifted/talented), special education enrollment (coded as 1 = enrolled in special education services, 0 = not enrolled), homeless/highly mobile (HHM; coded as 1 = yes, 0 = no), total days enrolled in MPS during academic year (AY) 2015-2016, and racially isolated schools (coded as 1 = racially isolated, 0 = not racially isolated).

All control variables were included at level 1 (i.e., student-level) except for the racial isolation variable, which was included as a level 2 (i.e., school-level) predictor.

Both dummy coded and continuous variables were centered at the grand mean (i.e., the mean for the full sample, rather than means within schools). Grand mean centering is common practice in HLM, as it facilitates interpretation of the intercepts, particularly when a 0 value is not meaningful (e.g., grade, days enrolled in MPS). Though the 0 value of dummy coded variables is meaningful, they were grand mean centered because the four primary background variables were later included in interaction terms. This process changed the interpretation of the model's dummy coded variables, such that the variable's intercept became the proportion of 0 values in the sample. For instance, by grand mean centering FRL eligibility (coded as 1 = eligible, 0 = not eligible), the FRL intercept was interpreted as the proportion of non-eligible students in the model rather than the expected mathematics growth z-score for non-eligible students (Raudenbush & Bryk, 2002).

Only five variables significantly predicted mathematics growth: grade (t = 2.98, p = .003), African American race/ethnicity (t = -4.65, p < .001), FRL eligibility (t = 3.61, p < .001), gifted/talented (t = 9.37, p < .001), and special education (t = 3.20, p = .001). The addition of control variables resulted in a 5.5% reduction in level 1 error variance (r_{ij}), and a 36.6% reduction in level 2 error variance (u_{oj}) from the fully unconditional model.

Model fit was tested by comparing the AIC and BIC values between the fully unconditional and control models, and by conducting a deviance test. Both AIC and BIC values were smaller in the control (AIC = 12,024.4; BIC = 12,145.7) than unconditional (AIC = 12,255.5, BIC = 12,145.7) models, a sign that the control model is a better fit to the data. In addition, a deviance test ($D_0 - D_1$, compared to a critical χ^2 with degrees of freedom k_0-k_1, where D = deviance statistic and k = number of parameters estimated)

found statistically significant results [χ^2 (16) = 263.1, $p < .001$], suggesting that the control model was, in fact, a better fit than the fully unconditional model. However, the ICC indicated that 7.7% ($\rho = .0771$) of the variation remained between schools, so I continued modeling.

Before fitting the social emotional model to the data, I attempted to increase model parsimony by removing non-significant predictors from the control model (i.e., gender, home language, homeless/highly mobile, enrolled days, racially isolated schools) and examining model fit. Control variables were removed both simultaneously and incrementally; the AIC/BIC values were examined and a deviance test was conducted to examine model fit. However, none of the deviance tests were statistically significant, and the AIC/BIC values were larger in the more parsimonious models than the full control model described above. Thus, all control variables, including non-significant ones, were included in the model moving forward.

Next, the social emotional model was fit to the data, which involved adding the four social emotional constructs (i.e., assertiveness, critical thinking, emotional control, empathy) to the control model. This approach determined the impact of social emotional competence on achievement, above and beyond traditional predictors. All four social emotional constructs were grand mean centered, such that their intercepts reflected the expected mathematics growth z-score when students' scores on these four scales were "average."

Seven variables in the social emotional model significantly predicted students' MCA mathematics growth: critical thinking ($t = 2.16$, $p = .031$), emotional control ($t = 6.93$, $p < .001$), grade ($t = 3.44$, $p < .001$), African American race/ethnicity ($t = -3.65$, $p <$

.001), FRL eligibility (t = 2.80, p = .005), gifted/talented (t = 8.31, p < .001), and special education (t = 2.83, p = .005). Neither assertiveness (t = 1.39, p = .164) nor empathy (t = .89, p = .375) significantly predicted students' mathematics growth. The inclusion of social emotional variables resulted in only a 1.7% reduction in level 1 error variance (r_{ij}), but the ICC remained largely unchanged, with 7.5% (ρ = .0751) of the variation remaining between schools (compared to ρ = .0771 in the control model). This finding is not surprising, for the social emotional model included no additional level 2 predictors.

AIC and BIC values were again smaller in the social emotional (AIC = 11,900.3, BIC = 12,047.1) versus control (AIC = 12,024.4; BIC = 12,145.7) model, and a deviance test found statistically significant results [χ^2 (4) = 132.1, p < .001]. Taken together, this indicates that despite the small predictive value of social emotional constructs, the inclusion of these variables provided a better fit to the data than a model with only control variables.

Before modeling cultural variation, I again attempted to increase model parsimony by removing assertiveness and empathy – the two non-significant social emotional variables – from the model. Model fit was examined for three models: neither assertiveness nor empathy, assertiveness but not empathy, and empathy but not assertiveness. All tests of model fit, including AIC/BIC values and deviance tests, suggested that the full social emotional model provided the best fit for the data despite including two additional, non-significant predictors. Thus, moving forward, all four social emotional constructs were included in the model.

The next model, the cultural variation model, aimed to determine whether the relationship between social emotional competence and mathematics growth held for

diverse students. This was achieved by including interaction terms between background variables (i.e., gender, race/ethnicity, home language, FRL) and social emotional (i.e., assertiveness, critical thinking, emotional control, empathy) variables and testing for moderator effects. Because all background variables were categorical rather than continuous, including interactions for all 4 background with all 4 social emotional variables would result in 40 interaction terms (i.e., 1 per social emotional construct for both gender and FRL, and 4 per social emotional construct for both race/ethnicity and home language). Thus, interaction terms were only created among statistically significant background and social emotional variables. This resulted in the inclusion of ten interaction terms: race/ethnicity with critical thinking (four interactions), race/ethnicity with emotional control (four interactions), FRL with critical thinking (one interaction), and FRL with emotional control (one interaction). Interaction terms were created by multiplying the grand mean centered, dummy coded background variables with the grand mean centered social emotional variables.

None of the ten interaction terms significantly predicted mathematics growth, but three interactions – Asian race/ethnicity with critical thinking ($t = 1.94$, $p = .052$), Hispanic race/ethnicity with critical thinking ($t = -1.83$, $p = .068$), and American Indian race/ethnicity with emotional control ($t = 1.68$, $p = .093$) – approached statistical significance. Though debate exists over the appropriateness of stating that an effect is "approaching" significance, it is important to mention, for despite this study's large sample size, this HLM was underpowered to detect small effects. This will be discussed in more detail in Chapter Five.

Not surprisingly, the inclusion of these moderators resulted in almost no reduction in level 1 error variance (0.01%), and both the AIC and BIC values were larger in the cultural variation (AIC = 11,901.1; BIC = 12,111.7) than social emotional (AIC = 11,900.3, BIC = 12,047.1) model. However, a deviance test found statistically significant results [χ^2 (10) = 19.2, p = .038], which, when taken alone, suggests the cultural variation model provided a better fit than the social emotional model. Because all other indicators of model fit suggested otherwise, and because the social emotional model was much more parsimonious than the cultural variation model, the social emotional model was selected as the final, most appropriate model for the data.

Final model coefficients and standard errors can be found in Table 21 (see Appendix D for a summary of interaction results). The final model equation is as follows:

$$Y_{ij} = \gamma_{00} + \gamma_{01}(W_{RacialIsolationj}) + \gamma_{10}(X_{Assertivenessij} - \overline{X}_{Assertiveness}) + \gamma_{20}(X_{CriticalThinkingij} - \overline{X}_{CriticalThinking}) + \gamma_{30}(X_{EmotionalControlij} - \overline{X}_{EmotionalControl}) + \gamma_{40}(X_{Empathyij} - \overline{X}_{Empathy}) + \gamma_{50}(X_{Gradeij} - \overline{X}_{Grade}) + \gamma_{60}(X_{Maleij}) + \gamma_{70}(X_{AfricanAmericanij}) + \gamma_{80}(X_{AmericanIndianij}) + \gamma_{90}(X_{Asianij}) + \gamma_{100}(X_{Hispanicij}) + \gamma_{110}(X_{HmongHLij}) + \gamma_{120}(X_{SomaliHLij}) + \gamma_{130}(X_{SpanishHLij}) + \gamma_{140}(X_{OtherHLij}) + \gamma_{150}(X_{FRLij}) + \gamma_{160}(X_{Gifted/Talentedij}) + \gamma_{170}(X_{SpecialEducationij}) + \gamma_{180}(X_{HHMij}) + \gamma_{190}(X_{EnrolledDaysij} - \overline{X}_{EnrolledDays}) + u_{0j} + r_{ij}$$

Table 21. Final Model Coefficients: MCA Mathematics Growth

Fixed Effects	**Coefficient**	**Standard Error**	***t* value**
Level 2: Schools			
Intercept	-.03	.07	-.47
Racial Isolation	-.11	.10	-1.13
Level 1: Individuals			
Assertiveness	.04	.03	1.39
Critical Thinking	.06	.03	2.16*
Emotional Control	.14	.02	6.93***
Empathy	.02	.03	.89
Grade	.04	.01	3.44***
Male vs. Female	.01	.03	.17
African American vs. White	-.19	.05	-3.65***

Fixed Effects	Coefficient	Standard Error	*t* value
American Indian vs. White	-.03	.10	-.34
Asian vs. White	.05	.08	.62
Hispanic vs. White	-.10	.07	-1.40
Hmong vs. English Home Language	-.10	.11	-.92
Somali vs. English Home Language	.04	.06	.58
Spanish vs. English Home Language	-.03	.08	-.41
Other vs. English Home Language	.15	.09	1.66
FRL Eligibility	.13	.05	2.80**
Gifted/Talented	.31	.04	8.31***
Special Education	.14	.05	2.83**
Homeless/Highly Mobile	-.11	.08	1.33
Enrolled Days AY 2015-2016	.00	.00	1.22

Note. $*p < 0.05$, $**p < .01$, $***p < .001$. All variables, including dummy coded and dicho tomous variables, were grand mean centered.

I then checked model assumptions for the final (i.e., social emotional) model: (1) level one and level two residuals are uncorrelated; (2) homogeneity of variances; (3) multivariate normality; (4) linearity; (5) clusters are exchangeable; (6) clusters were randomly sampled; and (7) model misspecification. The association between level 1 (r_{ij}) and level 2 (u_{0j}) residuals (assumption 1) was assessed with a visual examination of scatterplots of level 1 residuals on clusters and level 1 on level 2 residuals. No discernible pattern was detected, providing evidence supporting these assumptions. Next, homogeneity of variances (assumption 2) was assessed with a Bartlett test, which found statistically significant results [K^2 (41) = 493.18, $p < .001$]. This is problematic, for it implies that the assumption of equal variances was not valid for this model. Suspect cases were identified as those on the tail end of a Q-Q plot or those with standardized residuals (r_{ij}) > 3.5 SD or < -3.5 SD. These cases were removed for a total of 9 cases, and the Bartlett test was rerun. Again, this test found statistically significant results [K^2 (41) =

268.10, $p < .001$], suggesting that the variances were heteroscedastic, and assumption 3 was not satisfied.

Multivariate normality (i.e., [$u_{oj} \sim (N, \tau)$, $r_{ij} \sim (0, \sigma^2)$]; assumption 3) was confirmed with a visual analysis of Q-Q plots of both level 1 and level 2 residuals, and linearity (assumption 4) was confirmed by examining a plot of level 1 residuals on fitted values, and plots of the outcome score (i.e., growth z-scores) on each social emotional variable. Both assumptions 5 and 6 were a function of random sampling, and were considered satisfied. Finally, model misspecification (assumption 7) was assessed by examining a plot of level 1 residuals on fitted values and by calculating the ICC (unexplained between-cluster variance). Models are considered misspecified unless they explain 100% of the variance in the outcome variable, a phenomenon extremely unlikely in social science research. However, this model kept misspecification to a minimum by including theoretically and empirically supported confounds.

In sum, this model found that two social emotional competencies – critical thinking and emotional control – predicted students' growth on the mathematics subtest of the MCA above and beyond traditional predictors, such as race/ethnicity, FRL eligibility, and gifted/talented status. The magnitude of these relations were small, with a one unit increase in the average student's score on critical thinking and emotional control resulting in a .06 SD and .14 SD unit increase in student mathematics growth, respectively. Assertiveness and empathy did not significantly predict students' mathematics growth.

Interestingly, this analysis found no evidence of an interaction between statistically significant background (i.e., African American vs. White race/ethnicity, FRL

eligibility) and social emotional (i.e., critical thinking, emotional control) predictors, suggesting that the relationship between social emotional competence and student achievement was consistent for students of different backgrounds. However, this model did not meet one fundamental assumption of HLM: homoscedasticity of variances. Thus, these findings should be carefully applied to the larger population.

Reading

The above described model was replicated using growth z-scores from the MCA reading test. Reading growth z-scores were calculated for 4,526 students (68.3%) in 42 schools (87.5%); as expected, reading growth z-scores followed a normal distribution (M = .01, SD = 1.03). Of the 2,097 (31.7%) students from 6 schools (12.5%) who were missing reading growth z-scores, 1,321 (63.0%) were in grades 9-12. Because the reading subtest of the MCA is only administered in grades 3-8 and again in grade 10, these missing values were expected.

The remaining 776 students (37.0% of missing cases) were missing growth scores for unknown reasons, so chi-square analyses were conducted to compare these students with the 4,526 students who had growth z-scores to determine whether these groups were systematically different. Results are available in Table 22. The chi square analyses found several important differences between these groups. White, English-speaking, Somali-speaking, Spanish-speaking, FRL eligible, special education, and gifted/talented students were slightly overrepresented in the sample, while African American students, Hmong-speakers, and students who spoke other/unknown languages were slightly underrepresented. Findings from the subsequent analysis should be applied carefully to these groups.

Table 22. Students with (Complete) vs. without (Missing) Reading Growth Z-scores

	Complete (N = 4,526) N (%)	**Missing (N = 776) N (%)**	**χ^2 (df)**
Gender	2305 (85.6)	387 (14.4)	.30 (1)
Female	2221 (85.1)	389 (14.9)	
Male			
Ethnicity	1285 (74.9)	430 (25.1)	229.31*** (4)
African American	127 (87.6)	18 (12.4)	
American Indian	334 (87.2)	49 (12.8)	
Asian	771 (88.9)	96 (11.1)	
Hispanic	2009 (91.7)	183 (8.3)	
White			
Home Language	141 (92.2)	12 (7.8)	80.67*** (4)
Hmong	404 (75.2)	133 (24.8)	
Somali	675 (91.8)	60 (8.2)	
Spanish	137 (78.7)	37 (21.3)	
Other/Unknown	3169 (85.6)	534 (14.4)	
English	2417 (81.0)	568 (19.0)	105.48*** (1)
FRL Eligible	140 (51.1)	134 (48.9)	271.58*** (1)
HHM	431 (80.1)	19.9 (107)	13.22*** (1)
Special Education	970 (95.2)	49 (4.8)	97.51*** (1)
Gifted/Talented			
Grade	1786 (86.7)	273 (13.3)	8.18* (2)
4	10 (90.9)	1 (9.1)	
5[a]	1453 (85.9)	239 (14.1)	
6	6 (37.5)	10 (62.5)	
7[a]	1271 (83.4)	253 (16.6)	
8			
	M (SD)	***M (SD)***	***t* (df)**
Days Enrolled	175.31 (7.19)	149.36 (44.94)	36.25*** (5300)

Note. *$p < 0.05$, **$p < .01$, ***$p < .001$. [a] indicates dropped from the chi-square analysis due to small sample size. Maximum number of enrolled days = 176.

I then proceeded to the HLM, which involved fitting four models: (1) fully unconditional model, (2) control model, (3) social emotional model, and (4) cultural variation model. First, the fully unconditional model (equivalent to a one-way random effects ANOVA) determined how much variance in reading growth was due to the school students attended. This model was as follows: $Y_{ij} = \gamma_{00} + u_{0j} + r_{ij}$, where Y_{ij} = the i^{th}

student in j^{th} cluster's MCA mathematics growth z-score, γ_{00} = grand mean MCA reading growth z-score score, u_{0j} = level 2 error (unexplained school-level variance), r_{ij} = level 1 error (unexplained student-level variance). As suspected, students' reading growth was due, in part, to school, which explained 7.8% (ρ = .0778) of the variance in student growth. This value is greater than ρ = .05, the cutoff at which HLM is deemed necessary (Raudenbush & Bryk, 2002).

Because HLM was found to be the most appropriate analytic approach for the data, I then used the Optimal Design Software (Raudenbush et al., 2011) to set alpha and power for the HLM using characteristics of the sample. With α = .05, 42 clusters (i.e., schools), an average sample size of 135 students per school, and an intraclass correlation coefficient (ICC; ρ) of .08, I could detect an effect of .40 SD with .99 power, .33 SD with .95 power, .30 SD with .90 power, .27 SD with .85 power, and .26 SD with .80 power. Per the norm in educational psychology, power was set at .85, thereby allowing me to detect an effect $\geq$ .27 SD.

I then fit a control model, including the same demographic and background variables included in the mathematics HLM (i.e., grade, gender, race/ethnicity, home language, FRL eligibility, gifted/talented, special education enrollment, HHM, total days enrolled in MPS during AY 2015-2016, and racially isolated schools); all variables were coded in the same manner as the prior model. Again, all but one control variable was included at level 1 (racially isolated school was a level 2 predictor), and both dummy coded and continuous variables were grand mean centered.

Eight control variables significantly predicted students' reading growth: grade (t = 2.62, p = .024), gender (t = -2.30, p = .022), African American race/ethnicity (t = -3.44, p

< .001), American Indian race/ethnicity (t = -2.47, p = .014), other/unknown home language (t = 2.16, p = .031), FRL eligibility (t = 4.27, p < .001), gifted/talented (t = 8.94, p < .001), and special education status (t = 3.09, p = .002). The inclusion of control variables resulted in a 5.1% reduction in level 1 error variance (r_{ij}) and a 42.9% reduction in level 2 error variance (u_{oj}). Model fit was further tested by comparing AIC/BIC values and conducting a deviance test between the unconditional and control models. Both AIC and BIC values were smaller in the control (AIC = 12,695.5; BIC = 12,817.4) than unconditional (AIC = 12,914.9; BIC = 12,934.2) model, suggesting that the control model provided a better fit. This conclusion was further supported by the deviance test, which found statistically significant results [χ^2 (16) = 251.4, p < .001]. However, 4.8% of the variance (ρ = .0483) remained between schools, supporting further modeling.

Before fitting the social emotional model, I attempted to create a more parsimonious model by removing the non-significant predictors from the previously described control model (i.e., HHM, enrolled days, racially isolated schools). Variables were removed both simultaneously and incrementally for a total of four control models: (1) no HHM, enrolled days, or racially isolated schools variable; (2) no HHM variable; (3) no enrolled days variable; and (4) no racially isolated schools variable. Each time, model fit was assessed by conducting a deviance test and comparing the AIC/BIC values between the original control and new control model. Because none of the four new control models provided a better fit to the data, all control variables were included in subsequent models.

Next, social emotional competence was modeled by adding the four social emotional variables (i.e., assertiveness, critical thinking, emotional control, empathy) to

the control model. Nine variables significantly predicted students' reading growth: assertiveness (t = 2.08, p = .038), emotional control (t = 5.80, p < .001), grade (t = 2.53, p = .012), African American race/ethnicity (t = -2.54, p = .011), American Indian race/ethnicity (t = -2.10, p = .036), other/unknown home language (t = 2.16, p = .031), FRL eligibility (t = 3.70, p < .001), gifted/talented (t = 8.14, p < .001), and special education status (t = 2.77, p = .006). Interestingly, neither critical thinking (t = -.28, p = .781) nor empathy (t = .85, p = .398) significantly predicted reading growth, and with the inclusion of social emotional competence, gender was no longer statistically significant (t = -1.08, p = .282).

Although the inclusion of social emotional competence only resulted in a 0.01% reduction in level 1 error variance, the deviance test found statistically significant results [χ^2 (4) = 90.0, p < .001]. In addition, an examination of the AIC/BIC found smaller values for the social emotional (AIC = 12,613.5; BIC = 12,761.0) than control (AIC = 12,695.5; BIC = 12,817.4) model. Taken together, these findings suggest that the social emotional model provided a better fit to the data than the control model.

To increase parsimony, I again removed the two non-significant social emotional variables (i.e., critical thinking and empathy) from the model. Model fit was then examined for each of these three models: neither critical thinking nor empathy, critical thinking but not empathy, and empathy but not critical thinking. For all three models, AIC/BIC values and deviance tests suggested that the full social emotional model provided the best fit. Thus, all four social emotional variables were included in the final model.

Finally, the cultural variation model determined whether the relationship between social emotional competence and reading achievement held for students of diverse backgrounds. This was achieved by including interaction terms between significant background (i.e., grade, race/ethnicity, home language, FRL eligibility) and social emotional (i.e., assertiveness, emotional control) variables. A total of 20 interaction terms were included in the model: race/ethnicity with assertiveness (4 interactions), race/ethnicity with emotional control (4 interactions), home language with assertiveness (4 interactions), home language with emotional control (4 interactions), gender with assertiveness (1 interaction), gender with emotional control (1 interaction), FRL eligibility with assertiveness (1 interaction), FRL eligibility with emotional control (1 interaction).

Only 1 of the 20 interactions significantly predicted reading growth: Spanish vs. English home language with assertiveness (t = -2.47, p = .014). Though this finding is undoubtedly interesting, all measures of model fit suggested the cultural variation model did not provide a better fit than the social emotional model. The inclusion of these 20 terms resulted in < .01% reduction in level 1 error variance, the AIC and BIC values were larger in the cultural variation (AIC = 12,638.4; BIC = 12,914.2) than social emotional (AIC = 12,613.5; BIC = 12,761.0) model, and a deviance test did not find statistically significant results [χ^2 (20) = 15.1, p = .771]. Consequently, I concluded that the social emotional model provided the best fit to the data.

Final model coefficients and standard errors can be found in Table 23 (see Appendix D for a summary of the cultural variation model). The final model equation is as follows:

$$Y_{ij} = \gamma_{00} + \gamma_{01}(W_{RacialIsolationj}) + \gamma_{10}(X_{Assertivenessij} - \bar{X}_{Assertiveness}) + \gamma_{20}(X_{CriticalThinkingij} - \bar{X}_{CriticalThinking}) + \gamma_{30}(X_{EmotionalControlij} - \bar{X}_{EmotionalControl}) + \gamma_{40}(X_{Empathyij} - \bar{X}_{Empathy}) + \gamma_{50}(X_{Gradeij} - \bar{X}_{Grade}) + \gamma_{60}(X_{Maleij}) + \gamma_{70}(X_{AfricanAmericanij}) + \gamma_{80}(X_{AmericanIndianij}) + \gamma_{90}(X_{Asianij}) + \gamma_{100}(X_{Hispanicij}) + \gamma_{110}(X_{HmongHLij}) + \gamma_{120}(X_{SomaliHLij}) + \gamma_{130}(X_{SpanishHLij}) + \gamma_{140}(X_{OtherHLij}) + \gamma_{150}(X_{FRLij}) + \gamma_{160}(X_{Gifted/Talentedij}) + \gamma_{170}(X_{SpecialEducationij}) + \gamma_{180}(X_{HHMij}) + \gamma_{190}(X_{EnrolledDaysij} - \bar{X}_{EnrolledDays}) + u_{0j} + r_{ij}$$

Table 23. Final Model Coefficients: MCA Reading Growth

Fixed Effects	**Coefficient**	**Standard Error**	***t* value**
Level 2: Schools			
Intercept	-.03	.06	-.44
Racial Isolation	-.08	.08	-1.01
Level 1: Individuals			
Assertiveness	.06	.03	2.08*
Critical Thinking	-.01	.03	-.28
Emotional Control	.12	.02	5.80***
Empathy	.02	.03	.85
Grade	.03	.01	2.53*
Male vs. Female	-.03	.03	-1.08
African American vs. White	-.13	.05	-2.54*
American Indian vs. White	-.21	.10	-2.10*
Asian vs. White	.05	.08	.66
Hispanic vs. White	-.08	.07	-1.14
Hmong vs. English Home Language	-.04	.12	-.35
Somali vs. English Home Language	.09	.07	1.35
Spanish vs. English Home Language	-.06	.08	-.75
Other vs. English Home Language	.20	.09	2.16*
FRL Eligibility	.17	.05	3.70***
Gifted/Talented	.31	.04	8.14***
Special Education	.14	.05	2.77**
Homeless/Highly Mobile	.06	.09	.68
Enrolled Days AY 2015-2016	.00	.00	-1.93[a]

Note. *$p < 0.05$, **$p < .01$, ***$p < .001$, [a]$p < .10$. All variables, including dummy coded a nd dichotomous variables, were grand mean centered.

Model assumptions were then checked for the final (i.e., social emotional) model:

(1) level one and level two residuals are uncorrelated; (2) homogeneity of variances; (3)

multivariate normality; (4) linearity; (5) clusters are exchangeable; (6) clusters were randomly sampled; and (7) model misspecification. The association between level 1 (r_{ij}) and level 2 (u_{0j}) residuals were assessed with a visual examination of scatterplots of level 1 residuals on clusters and level 1 on level 2 residuals. No discernible pattern was detected, providing evidence in support assumption 1. Next, the homogeneity of variances was assessed with a Bartlett test, which found statistically significant results [K^2 (41) = 149.05, $p < .001$], suggesting that the assumption of equal variances was not valid for this model. Suspect cases were identified as those on the tail end of a Q-Q plot or those with standardized residuals (r_{ij}) > 3.5 SD or < -3.5 SD. A total of 11 cases were removed following these guidelines, and the Bartlett test was rerun. Again, this test found statistically significant results [K^2 (41) = 119.05, $p < .001$], suggesting that the variances were heteroscedastic, and assumption 2 was not satisfied.

Multivariate normality (i.e., [$u_{oj} \sim (N, \tau)$, $r_{ij} \sim (0, \sigma^2)$]; assumption 3) was confirmed with a visual analysis of Q-Q plots of both level 1 and level 2 residuals, and linearity (assumption 4) was confirmed by examining a plot of level 1 residuals on fitted values, and plots of the outcome score on each social emotional variable. Both assumptions 5 and 6 were a function of random sampling, and were considered satisfied. Finally, model misspecification (assumption 7) was assessed by examining a plot of level 1 residuals on fitted values and by calculating the ICC (unexplained variance). Models are considered misspecified unless they explain 100% of the variance in the outcome variable, a phenomenon extremely unlikely in social science research. However, this model kept misspecification to a minimum by including theoretically and empirically supported confounds.

In sum, this model found that two social emotional competencies – assertiveness and emotional control – predicted students' growth on the reading subtest of the MCA above and beyond traditional predictors, such as race/ethnicity, FRL eligibility, and gifted/talented. The magnitude of these relations was small, with a one unit increase in the average student's score on assertiveness and emotional control resulting in a .06 SD and .12 SD unit increase in student growth, respectively. Neither critical thinking nor empathy significantly predicted students' reading growth.

Interestingly, this analysis found limited evidence of an interaction between statistically significant background (i.e., gender, race/ethnicity, home language, FRL eligibility) and social emotional (i.e., assertiveness, emotional control) predictors. Although 1 of 20 interaction terms included in the model significantly predicted reading growth (i.e., Spanish vs. English home language with assertiveness), indicators of model fit suggested that the inclusion of these interaction terms was detrimental to the overall fit of the data. Thus, cultural variation was practically limited in the present sample, and the relationship between social emotional competence and student achievement was deemed largely consistent for students of different backgrounds. However, this model did not meet one fundamental assumption of HLM: homoscedasticity of variances. Thus, these findings should be carefully applied to the larger student population.

Conclusions

These analyses utilized HLM to examine the impact of social emotional competence on mathematics and reading MCA growth. Overall, models found similar results, with emotional control, grade, African American race/ethnicity, FRL eligibility, gifted/talented, and special education enrollment significantly predicting both reading and

mathematics achievement. Most of these relations were comparable in magnitude. For instance, students enrolled in special education services had a growth z-score .14 SDs smaller in both mathematics and reading than students who were not enrolled in special education, and FRL eligible students had a growth z-score .13 SD and .17 SD units smaller than students not eligible for these services.

Two differences between mathematics and reading achievement are of note. Surprisingly, other/unknown home language only significantly predicted reading growth ($\gamma_{140} = .20$), such that students who spoke a language other than Hmong, Somali, Spanish, or English gained an additional .20 SD on the reading MCA test than students who spoke English. Second, and more interestingly, different social emotional competencies predicted mathematics and reading achievement, with critical thinking skills ($\gamma_{20} = .06$) predicting mathematics growth and assertiveness ($\gamma_{10} = .06$) predicting reading growth. These relations were small in magnitude, with a one unit increase in either critical thinking or assertiveness resulting in .06 SD growth. The magnitude of the relation among emotional control and mathematics and reading achievement was at least double that of critical thinking/assertiveness ($\gamma_{30} = .14$, $\gamma_{30} = .12$ for math and reading, respectively).

Research Question 4

The final set of analyses explored the relationship between social emotional competence and school discipline, as measured by student referrals. This involved conducting logistic regression models within seven middle schools (see Chapter Three for more information about this approach), predicting referrals (1 = 1 or more referral, 0 = no referrals) using student demographic and background variables as well as their

scores on the HSA. Rather than detailing findings from each of the seven models individually, this section provides an overview of results, identifying similarities and differences across models. A detailed description of each regression model is available in Appendix E.

Though the same variables were included in most of the seven models (school characteristics necessitated alterations to some models, see Table 25 and Appendix E for more detail), these analyses found many differences across schools. Most importantly, social emotional competencies were only predictive of student referrals in five of the seven middle schools. Emotional control consistently predicted referrals across all 5 of these schools, with a 1-unit increase in emotional control resulting in a 51% to 74% decrease in the likelihood of receiving a referral. The impact of emotional control on student referrals was largest in school 35 (OR = 74%, greater than the next school by 13% greater odds), in which several control variables – including race/ethnicity, home language, FRL eligibility, and gifted/talented – were excluded from the model due to little variability. It is possible that the larger effect of emotional control within this school may be a function of excluding important control variables from the model, and the magnitude of the relation between emotional control and referrals is more accurate in the remaining four models (with a 1-unit increase in emotional control resulting in a 51% to 61% decrease in odds).

Table 24. Middle School Characteristics: School Referral Analyses

	N (%)						
	School 3	**School 4**	**School 15**	**School 33**	**School 35**	**School 38**	**School 40**
Gender							
Female	188 (53.0)	158 (50.0)	115 (46.9)	147 (51.8)	46 (41.8)	184 (50.1)	205 (53.8)
Male	167 (47.0)	158 (50.0)	130 (53.1)	137 (48.2)	64 (58.2)	183 (49.9)	176 (46.2)
Race/Ethnicity							
White	188 (53.0)	47 (14.9)	188 (76.7)	53 (18.7)	9 (8.2)	186 (50.7)	176 (46.2)
African American	118 (33.2)	142 (44.9)	37 (15.1)	133 (46.8)	74 (67.3)	86 (23.4)	94 (24.7)
Hispanic	28 (7.9)	86 (27.2)	9 (3.7)	63 (22.2)	8 (7.3)	76 (20.7)	64 (16.8)
Asian	19 (5.4)	35 (11.1)	9 (3.7)	24 (8.5)	18 (16.4)	15 (4.1)	23 (6.0)
American Indian	2 (0.6)	6 (1.9)	2 (0.8)	11 (3.9)	1 (0.9)	4 (1.1)	24 (6.3)
Home Language							
English	281 (79.2)	196 (62.0)	238 (97.1)	182 (64.1)	95 (86.4)	250 (68.1)	295 (77.4)
Spanish	17 (4.8)	81 (25.6)	2 (0.8)	52 (18.3)	6 (5.5)	63 (17.2)	49 (12.9)
Somali	42 (11.8)	7 (2.2)	2 (0.8)	20 (7.0)	0 (0.0)	42 (11.4)	24 (6.3)
Hmong	2 (0.6)	18 (5.7)	1 (0.4)	15 (5.3)	8 (7.3)	1 (0.3)	1 (0.3)
Other/Unknown	13 (3.7)	14 (4.4)	2 (0.8)	15 (5.3)	1 (0.9)	11 (3.0)	12 (3.1)
FRL Eligible	145 (40.8)	248 (78.5)	47 (19.2)	227 (79.9)	103 (93.6)	155 (42.2)	222 (58.3)
HHM	9 (2.5)	20 (6.3)	3 (1.2)	16 (5.6)	10 (9.1)	14 (3.8)	20 (5.2)
Special Education	33 (9.3)	49 (15.5)	34 (13.9)	32 (11.3)	14 (12.7)	37 (10.1)	33 (8.7)
Gifted/Talented	60 (16.9)	39 (12.3)	57 (23.3)	34 (12.0)	13 (11.8)	68 (18.5)	61 (16.0)
	M(SD)						
Days Enrolled	174.48 (12.97)	168.64 (25.21)	173.49 (15.77)	166.05 (32.13)	156.45 (44.63)	173.23 (15.07)	172.16 (18.32)
Assertiveness	2.98 (.66)	2.92 (.62)	3.09 (.60)	3.03 (.66)	2.99 (.69)	3.02 (.62)	3.08 (.61)
Critical Thinking	3.02 (.65)	2.93 (.62)	3.12 (.61)	3.03 (.68)	2.88 (.72)	3.01 (.66)	3.00 (.61)
Emotional Control	3.19 (.77)	2.86 (.81)	3.26 (.76)	2.71 (.88)	2.76 (.73)	3.05 (.84)	3.02 (.82)
Empathy	3.37 (.67)	3.08 (.73)	3.47 (.63)	3.06 (.76)	2.93 (.83)	3.26 (.71)	3.30 (.68)

Note. N_3 = 353; N_4 = 316; N_{15} = 245; N_{33} = 284; N_{35} = 110; N_{38} = 367; N_{40} = 381.

Table 25. The Effects of Background Variables and Social Emotional Competence on Student Referrals

	#3 (N = 353)			#4 (N = 316)			#15 (N = 245)			# 33 (N = 284)		
	B	**Wald**	**OR**	**B**	**Wald**	**OR**	**B**	**Wald**	**OR**	**B**	**Wald**	**OR**
Step 1												
Male	1.28	11.51**	3.61	.42	.84	1.52	2.26	12.47***	9.61	.69	3.10	1.98
African American	.89	2.72	2.44	1.52	.175	4.57	1.44	4.47*	4.21	1.80	8.40**	6.06
American Indian	-	-	-	-	-	-	-	-	-	-	-	-
Asian	.09	.01	1.09	-	-	-	-	-	-	-17.40	.00	.00
Hispanic	-1.17	.82	.31	-1.89	.28	.15	-	-	-	.41	.11	1.51
Other	-	-	-	-17.01	.00	.00	1.27	3.02	3.55	-	-	-
Hmong HL	-	-	-	-	-	-	-	-	-	-	-	-
Somali HL	1.61	8.68**	4.99	-	-	-	-	-	-	-	-	-
Spanish HL	.95	.43	2.60	.58	.0	1.78	-	-	-	-1.13	.73	.33
Other HL	.03	.00	1.03	-18.33	.00	.00	-	-	-	-1.53	4.90*	.22
FRL	1.16	5.26*	3.18	1.17	1.01	3.22	1.46	5.66*	4.75	-.14	.09	.87
Gifted/Talented	-1.47	5.07*	.23	-	-	-	-.12	.03	.89	-.67	.60	.51
Special Education	-1.26	5.78*	.28	.63	1.77	1.87	.50	.80	1.66	.96	3.89*	2.62
Days Enrolled	.01	.20	1.01	.01	.54	1.01	.00	.00	1.00	.01	.90	1.01
$R^{2a}(\chi^2)$	.45 (130.63***)			.32 (50.07***)			.48 (85.07***)			.32 (61.14***)		
Step 2												
Assertiveness	.24	.51	1.23	-.46	1.20	.63	.03	.01	1.03	-.25	.55	.78
Critical Thinking	-.16	.19	.86	.10	.05	1.11	.41	.67	1.50	.87	4.14*	2.38
Emotional Control	-.89	14.07***	.41	-.54	2.44	.58	-.96	9.37**	.39	-.71	8.74**	.49
Empathy	-1.49	20.72***	.23	-.10	.09	.90	-.87	4.57*	.42	-.64	3.74	.53
$R^{2a}(\chi^2)$	.59 (51.56***)			.33 (3.08)			.54 (14.76**)			.38 (14.06**)		

Note. *p < .05, **p < .01, ***p < .001; [a] = Nagelkerke R^2

Table 25 Continued

	#35 (N = 110)			#38 (N = 367)			#40 (N = 381)		
	B	**Wald**	**OR**	**B**	**Wald**	**OR**	**B**	**Wald**	**OR**
Step 1									
Male	1.98	3.45	7.25	.76	2.79	2.13	1.22	17.39***	3.40
African American	-	-	-	1.35	3.45	3.87	.54	1.88	1.71
American Indian	-	-	-	-	-	-	-.20	.11	.82
Asian	-	-	-	-	-	-	-.19	.07	.83
Hispanic	-	-	-	-.95	.48	.39	.00	.00	1.00
Other	-	-	-	.14	.02	1.16	-	-	-
Hmong HL	-	-	-	-	-	-	-	-	-
Somali HL	-	-	-	-.09	.02	.92	-1.05	2.84	.35
Spanish HL	-	-	-	.79	.32	2.21	-.34	.20	.72
Other HL	-	-	-	-.64	.31	.53	.25	.09	1.29
FRL	-	-	-	.37	.32	1.44	.10	.09	1.11
Gifted/Talented	-	-	-	-.45	.31	.64	-.60	1.71	.55
Special Education	.19	.04	1.21	.86	2.30	2.36	.01	.00	1.01
Days Enrolled	.04	.96	1.04	.00	.10	1.00	.00	.00	1.00
$R^{2a}(\chi^2)$	.12 (6.26)			.18 (30.14**)			.20 (54.42***)		
Step 2									
Assertiveness	1.31	2.61	3.72	.01	.00	1.01	.20	.45	1.22
Critical Thinking	-1.26	2.75	.28	-.20	.22	.82	-.02	.01	.98
Emotional Control	-1.36	5.18*	.26	-.34	1.69	.72	-.74	16.10***	.48
Empathy	-.38	.46	.68	-.11	.09	.90	-.72	8.35**	.49
$R^{2a}(\chi^2)$	.32 (12.28*)			.20 (2.76)			.30 (31.42***)		

Note. *$p < .05$, **$p < .01$, ***$p < .001$; [a] = Nagelkerke R^2

Empathy was a significant predictor of student referrals in three schools, with a one-unit increase in empathy resulting in a 49% to 77% decrease in the likelihood of being referred, and critical thinking only predicted referrals in one school. However, unlike emotional control and empathy, critical thinking positively predicted student referrals, such that a one-unit increase in critical thinking skill increased students' odds of being referred 2.38 times over. These data are unable to explain why students with greater critical thinking skill were more likely to be referred, while students with greater empathy and emotional control were less likely. Assertiveness did not predict student referrals in any of the seven schools.

As expected, student background characteristics predicted referrals, with inconsistent relations across schools. Interestingly, none of the control variables predicted referrals within 3 schools (4, 35, 38, though several important variables were missing from the model in one of these schools (35). Few patterns were identified in the remaining 4 schools. Males were more likely to be referred than females in three schools, and in two schools, FRL eligible and African American students were more likely to be referred than non-eligible students and White students. Within school 3, Somali home language and special education enrollment were associated with increased odds of receiving a referral, while the opposite was true (including Somali, Hmong, or other languages and special education enrollment) in school 33. These models are unable to explain why these competing relationships exist, though it seems likely that differences in school practices and contexts can, to some extent, explain these relations (e.g., in school 4, the majority of students were eligible for FRL [78.5%], and African American [44.9%] was the largest racial/ethnic group, while most other schools had smaller frequencies of

FRL eligible students and White was the largest racial/ethnic group). In sum, though these findings suggest that both social emotional competence and student background characteristics are important predictors of student discipline, the relation between these constructs is complex and clearly impacted by contextual factors. However, because the disciplinary variable differed from school to school, deeper understandings of these complex relations may require strong contextual knowledge of the practices and culture of each school.

Summary

This chapter summarized several findings from this dissertation. First, it presented results from preliminary analyses examining the psychometric properties of the HSA, including a CFA, reliability analysis, and correlational analyses. Next, it outlined findings from each of the four research questions, describing the relations among the four social emotional competencies, both within and across student backgrounds; determining whether students of different backgrounds scored differently on each subscale than students of the majority culture; and exploring the relationship between social emotional competence, background characteristics, and two important educational outcomes (academic achievement and student behavior). Analyses found some support for the cultural approach to competence. The intercorrelations among the four competencies varied in magnitude across genders, racial/ethnic groups, home language groups, and socioeconomic statuses. In addition, these background variables were statistically significant predictors of social emotional competence, though effects were near zero for assertiveness and critical thinking, small for empathy, and small to moderate for emotional control. Analyses also found evidence that social emotional competence was

predictive of student success, but found no evidence of invariance among these relations, suggesting that the pattern of relations between social emotional competence and achievement was similar across backgrounds. The next chapter, Chapter Five, will conclude this dissertation, providing a discussion of findings, implications for the field, and suggestions for future research.

Chapter Five: Discussion

This dissertation aimed to explore the role of student background and cultural characteristics in defining social emotional competence. Specifically, it addressed how students' cultural backgrounds relate to their responses on measures of social emotional competence and the relations between social emotional competence and educational success. This study was informed by four research questions that laid the groundwork for examining and exploring cultural differences:

1. To what extent are social emotional skills (empathy, emotional control, critical thinking, assertiveness) related to one another?
2. On average, do students of different cultural groups (i.e., race/ethnicity, home language, income status, gender) score differently on measures of social emotional skills (empathy, emotional control, critical thinking, assertiveness)?
3. To what extent do social emotional skills (empathy, emotional control, critical thinking, assertiveness) predict student achievement, above and beyond traditional predictors of achievement?
    a. How are social emotional skills related to traditional predictors of academic success and achievement?
    b. Is the relationship between social emotional skills and student achievement invariant across cultural groups (i.e., race/ethnicity, home language, income status, gender)?
4. To what extent do social emotional skills (empathy, emotional control, critical thinking, assertiveness) predict student behavior, above and beyond traditional predictors of behavior?

Although most of this work was exploratory in nature, three hypotheses were developed a priori: (1) all four social emotional variables (i.e., assertiveness, critical thinking, emotional control, empathy) would be significantly correlated with one another; (2) on average, different cultural groups would score differently on measures of social emotional competence; and (3) social emotional competence would predict student achievement and behavior, but the relationship between social emotional competence and achievement would be moderated by cultural group membership. The following section provides a summary and interpretation of these findings.

Discussion of Findings

Preliminary Analyses

The Holistic Student Assessment (HSA), this study's measure of social emotional competence, appeared to be a psychometrically sound instrument. A confirmatory factor analysis (CFA) found that the hypothesized four-factor structure fit the data well across fourth, sixth, eighth, and tenth grades, and three of the four HSA subscales (critical thinking, emotional control, empathy) evidenced acceptable or good internal consistency reliability. One subscale (assertiveness), however, evidenced lesser reliability, suggesting students may not be responding to the assertiveness items consistently.

On average, students' scores on the HSA were high (assertiveness $M = 3.03$; critical thinking $M = 3.10$; emotional control $M = 3.03$; and empathy $M = 3.29$ out of 4.00) and comparable (< .50 SD difference) across grades. Students' scores on these competencies were related to several background characteristics, but relations were somewhat inconsistent. Assertiveness was unrelated to any of the background variables, and critical thinking was only related to socioeconomic status and achievement, such that

greater critical thinking skills were associated with a higher socioeconomic status (i.e., not FRL eligible) and higher achievement. Emotional control and empathy, however, were related to several background variables. Students with less emotional control tended to be male, African American, Somali-speaking, FRL eligible, and homeless/highly mobile (HHM), while students with less empathy tended to be younger, male, African American, and FRL eligible. Both emotional control and empathy were positively related to achievement, and empathy was the only construct related to student discipline, with less empathic students having more disciplinary issues.

Research Question 1: Interrelations among Social Emotional Competencies

As hypothesized, all four social emotional constructs were significantly related to one another. Higher levels of assertiveness were associated with greater critical thinking skills, more empathy, and less emotional control. More emotional control was associated with greater empathy and greater critical thinking skills, and greater critical thinking skills were associated with more empathy. These correlations varied in magnitude. Two correlations – assertiveness with critical thinking and critical thinking with empathy – were strong, one – assertiveness with empathy – was moderate, and the remaining three correlations – assertiveness with emotional control, critical thinking with emotional control, and empathy with emotional control – were weak.

The large relationships between critical thinking, assertiveness, and empathy were surprising, for intuitively, more academically-based competencies (e.g., critical thinking, study strategies) seem weakly related to more socially- and emotionally-based skills. Upon further inspection of the HSA (see Appendix A), these relations were clarified, for the HSA items are rather vague (e.g., “I like to think of different ways to solve a

problem"), and the survey instructions do not prime students with a particular context (e.g., school). It is not difficult to think of the ways in which individual students' ability to think deeply about an issue or situation extends to their ability to empathize with others' or speak out for themselves and others. If, however, as is common in the field of education, researchers are conceptualizing critical thinking in the context of academic content rather than social interactions, future research must be explicit about this definition, and ensure their tools clearly reflect their operational definitions.

The weak relationship among emotional control and assertiveness was also surprising. The emotional control items seem closely related to impulse control (e.g., "I react to things so quickly I get in trouble," "I get into trouble because I say a lot of things that just come to my mind"), and intuitively, impulse control seems closely related to assertiveness. In the present study, however, these two constructs were very weakly related. When taken together with the strong correlation between assertiveness and critical thinking, these findings suggest that students' tendencies to speak out or stand up for themselves is not necessarily impulsive, and may involve a more thoughtful process in which students evaluate the issue, and determine that vocalizing their opinions is the best option or response.

Intuitively, the weak relationships among emotional control with critical thinking and empathy are understandable. Students' ability to regulate their own emotions should be largely unrelated to their ability share another's feelings or think critically about issues, assuming these issues are not emotional in nature and/or a student is not experiencing emotional stress at the time they must enact empathy or demonstrate their critical thinking skills. The moderate relationship between assertiveness and empathy was

also intuitive, for students with great empathy can understand and share another's emotions, and may therefore be inclined to speak out in support of their peers who are facing challenging or unfair situations.

Because scores on the HSA were hypothesized to vary by cultural group membership, correlations among the four subscales were further examined within cultural groups (i.e., gender, race/ethnicity, home language, and socioeconomic status) to ensure these relations held for culturally diverse students. Three pairs of relations – assertiveness and empathy, critical thinking and empathy, and emotional control and empathy – varied across gender, race/ethnicity, home language, and socioeconomic status. The relationship between critical thinking and emotional control was a function of gender, race/ethnicity, and socioeconomic status, but not home language, while the relationship between assertiveness and critical thinking was a function of gender and home language, but not socioeconomic status or race/ethnicity. Finally, the relationship between assertiveness and emotional control was only a function of one cultural group: socioeconomic status. These differences varied in magnitude but not valence, such that certain skills were more strongly (or weakly) correlated within certain cultural groups, but the direction of relations remained the same.

These analyses were exploratory in nature, and unfortunately, little research is available to inform or explain the findings. What is clear, however, is that the interrelationships between these constructs are not equal across different cultural groups. For instance, FRL eligible students high on empathy were likely to score higher on both assertiveness and critical thinking than non-eligible students. This invariance could either be a function of theoretical differences, with certain skills being more closely or weakly

associated with one another in different cultures, or measurement tool issues, which would warrant the tool being reduced or eliminated and replaced with a different, culturally relevant tool.

Research Question 2: Cultural Differences in Social Emotional Competence

This study's second hypothesis, which predicted that students' level of social emotional competence would be, in part, a function of their cultural background, found partial support. Although all multiple regression analyses found statistically significant results, most of these results did not meet standards for practical significance (i.e., moderate relations, or $R^2 \geq .13$; Cohen, 1988). Culture had a negligible relation with both assertiveness and critical thinking, explaining between 1% and 3% of the variance. Culture had a stronger relationship with empathy – it explained up to 12% of the variance – but the practical significance of this relationship was called into question, for these effects were still considered "small" in magnitude. Emotional control was the only competency to find both statistically and practically significant relations with culture, but these relations only reached standards for practical significance among fourth- and sixth-graders. Thus, in the present study, younger, but not older, students' level of emotional control was, in part, a function of their cultural background, as measured by gender, race/ethnicity, home language, and socioeconomic status.

This study had a very large sample, necessitating the consideration of "practical significance." Even when the sample was separated into four smaller subsamples, these analyses could detect very small effects that may have little to no practical value for schools. Practical significance was somewhat arbitrarily defined as a moderate to large effect size; using Cohen's (1988) standards, this required that culture explain 13% or

more of the variance in social emotional competence. As described above, culture explained about 12% of the variance in four models (emotional control: 8th grade; empathy: 6th, 8th, and 10th grades), and while standards deem these relations not practically significant, one must consider the arbitrary nature of this cutoff, and determine whether a 1% difference in explained variance fairly argues for the (lack of) importance of these relations. Further examination of these relations may clarify their importance, and input from MPS may prove helpful in determining what is of value to the schools and what is too small a relationship to warrant further study.

These analyses aimed to examine the impact of culture on competence. One four-way MANOVA (with cultural/background characteristics as the independent variables, and the four social emotional competencies as the dependent variables) may have been a better approach than several regression models, as it would account for the many interactions between students' cultural identities. However, the four-way MANOVA was impractical due to many levels of the independent variables (five levels in race/ethnicity, five levels in home language, two levels in socioeconomic status, two levels in gender). This MANOVA would have included sixty groups of wildly varying sizes (e.g., American Indian, English, reduced price lunch eligible, female vs. White, English, no free/reduced lunch eligibility, male), confounding the interactions and making the results unreliable and uninterpretable.

Unfortunately, the interactions could not be replicated in the multiple regression analyses, for there was no literature to guide the examination of certain interactions, thereby requiring the examination of all possible interaction effects (i.e., 64 interaction terms per model). Because no literature can guide this work, future research may utilize

the expertise of educators and other school personnel to identify potential interactions of interest. For example, MPS has a large population of Somali students. These students are classified as Black or African American in school data, but Somali students tend to have unique cultural and linguistic strengths and challenges as compared to the larger Black or African American population. By interacting race/ethnicity with home language, these analyses may have been able to parse out relations between Black/African American race/ethnicity versus Somali ethnicity/nationality with social emotional competence and academic achievement. Overall, until empirical literature can inform researchers' efforts, school professionals may be able to provide practical and theoretical guidance in these areas.

Research Question 3: Relations between Competence and Student Achievement

The third hypothesis expected that social emotional competence would predict student achievement, but these relations would be moderated by culture. This hypothesis was also partially supported, such that competence predicted achievement, but these relations were not necessarily moderated by culture. Emotional control predicted both mathematics and reading achievement, critical thinking predicted mathematics achievement, and assertiveness predicted reading achievement. All four of these relations were small in magnitude. Not surprisingly, empathy did not predict either mathematics or reading achievement.

The mathematics and reading HLMs found very limited evidence in support of moderator effects. In the mathematics model, three interactions – Asian race/ethnicity with critical thinking, Hispanic race/ethnicity with critical thinking, and American Indian race/ethnicity with emotional control –approached statistical significance. In the reading

model, one interaction – Spanish home language with assertiveness – reached statistical significance. In both models, however, model fit statistics suggested these interaction effects were a detriment to model fit, suggesting that culture did not moderate the relationship between social emotional competence and student achievement.

Though small, the relation between assertiveness and reading achievement was surprising. It is possible, though, that this relationship is the artifact of an unmeasured third variable such as verbal ability, for the assertiveness items are centered around verbal skills and behaviors (e.g., "I tell people what I think," "I say what I think even if adults or friends disagree"). The pervasive relationship between emotional control and achievement may also be due to a confounding variable such as students' academic behaviors (e.g., participation, attendance, engagement) or mental preparedness to learn, for if students are unable to regulate their emotions, small stressors may prevent them from focusing on the task at hand. Unfortunately, these predictions are based on pure speculation, for the literature has failed to identify why social emotional competencies are predictive of student success. Future research may illuminate these complex relationships by theorizing and testing potential paths between social emotional competencies and academic achievement (e.g., via other academic skills known to have a direct impact on student achievement, such as study strategies).

This study found little evidence of moderator effects between culture and social emotional variables. This may be due to several factors. First, the present study may have been underpowered to detect such effects. Though these analyses included over 4,000 students, the power of an HLM is largely determined by the number of clusters, which was relatively small (42). With .85 power, these models were only able to detect effects ≥

.32 SD and .27 SD for mathematics and reading achievement, respectively; if effect sizes were smaller than those values, the models were not likely to identify the relations as statistically significant. These results may also be due to the nature of an HLM, which accounts for variation as a function of clusters. MPS is a somewhat segregated school district, with many schools having high concentrations of one or two cultural groups (e.g., racial/ethnic groups, socioeconomic groups). The HLMs may therefore model some cultural variance as school variance, which could prevent some important predictors (i.e., background variables, the interaction terms) from reaching statistical significance.

Finally, the interactions – representing cultural variation – may not have reached statistical significance because the wrong interaction terms were included in the models. Because there was no literature to guide the selection of particular interaction terms and because including all interactions would have required modeling 40 additional terms, these analyses only modeled interactions for significant culture and social emotional variables. It is possible, however, that the main effects for certain variables were non-significant because the existence of an interaction was muddling the relationship between that variable and achievement. For example, if empathy interacted with gender, such that females' – but not males' – level of empathy predicted achievement, the messy, non-significant relation among males may have caused too much noise in the data to produce a significant main effect. Ideally, future research may test these possibilities by (a) analyzing outcome data that does not require the use of an HLM, (b) analyzing data in more integrated schools, and/or (c) working closely with school partners to identify potential interactions, and modeling these interactions despite the significance of their

main effects. These approaches will ensure that individual-level variation is modeled as such, and may offer researchers better chance of selecting important interaction terms.

Though these HLMs found interesting results, they may prove challenging to interpret in terms of past research. Most social emotional research has identified a relationship between competence and student achievement through the use intervention studies, which often utilize randomized designs. Rather than predicting achievement with students' social emotional skills, the field often examines impacts on achievement as the result of an intervention. It is possible that other components of these interventions (e.g., improved teacher-student or student-student relations) also impact student achievement, and the effects of social emotional interventions are not due to social emotional competence alone. Because students' level of social emotional competence (independent of an intervention) served as the primary independent variables in this research, findings may not be comparable to those in the literature.

Research Question 4: Relations between Competence and Student Discipline

The final hypothesis, which theorized that social emotional competence was predictive of student behavioral issues, also found partial support, with competence predicting student referrals, but only in five of the seven middle schools. Like student achievement, emotional control was the most consistent predictor of referrals, finding statistically significant results in all five schools. Empathy predicted student referrals in three schools, and critical thinking predicted referrals in one school. Interestingly, whereas greater levels of emotional control and empathy were associated with decreased odds of receiving a referral, increases in critical thinking were associated with increased

odds of receiving a referral. Assertiveness did not predict student referrals in any of the seven schools.

Social emotional competence is clearly an important predictor of student behavior, but the relation between these constructs appears to be contextually-bound, such that different competencies hold value in different schools and communities. This can be interpreted as evidence in support of the cultural approach to social emotional competence, for each school has its own culture, and as previously mentioned, schools in Minneapolis are often largely segregated. Unfortunately, this analysis was unable to provide further evidence in support or refutation of the cultural approach to competence (through the addition of interaction terms between social emotional competencies and cultural variables), for maximum likelihood estimation requires a larger sample size than OLS estimation, and by conducting analyses within rather than across schools, the sample sizes were too small to add so many new terms to the models. In future research, utilizing an outcome variable that is consistent across schools may allow researchers to examine potential moderator effects.

The interpretation of these findings is limited in two ways: (1) scope of study and (2) timing. First, these analyses were conducted within rather than across schools, posing an obstacle to generalizability, a major goal of quantitative research. The outcome variable in these analyses, student referrals, was school specific, with each school in MPS setting different standards and policies for disciplinary action. Although these analyses found some general trends, different school expectations for behavior may have impacted the relationship between competence and referrals. For example, social emotional competence may be significantly related to referrals in a school that had strict standards

for behavior, but this relationship may not be present in a school that had more liberal standards, for the same behaviors would not result in the same outcomes. Future research may address this concern by identifying a behavioral or disciplinary variable that is equal across schools.

Next, the outcome variable was measured across the course of the 2015-2016 AY, so any referrals received during the AY counted toward the outcome variable. Because the primary independent variables were measured in May 2016, the outcome variable was collected before the predictor variables for many, if not most, students. This is problematic, for students' social emotional skills at the time of their referral are not necessarily identical to their skills at the end of the AY. If, for example, a student received some form of support after being referred (e.g., worked with a school counselor), this intervention may have had some positive result on students' skills, which could have shown up as higher scores on the HSA in May, therefore confounding the relationship between competence and behavior. The opposite may also be true, such that not providing an intervention may have created additional challenges for the student, thereby decreasing their scores on certain skills. Because this study utilized secondary data, it was unable to account for these issues. However, future research may implement these surveys at the beginning of the school year and/or follow up with students after a referral to more clearly examine the relationship between these constructs.

Summary

All three of this dissertation's hypotheses received full or partial support. First, analyses found that all four constructs were significantly correlated with one another, though some relationships were very small in magnitude. Second, as hypothesized,

culture significantly predicted students' scores on social emotional competence. However, relationship sonly met standards for practical significance among emotional control, with culture seeming to play less of a role in the remaining three competencies, explaining small amount of variance in scores on empathy, and near zero variance in scores on assertiveness and critical thinking.

Lastly, social emotional competence was, in fact, predictive of student success. Emotional control found the most pervasive effects, significantly predicting mathematics achievement, reading achievement, and student behavior. Relations between the other competencies and success outcomes were somewhat inconsistent, with critical thinking predicting mathematics achievement and student behavior – though only in one school – assertiveness only predicting reading achievement, and empathy only predicting student behavior (in three schools). The second component of this hypothesis did not find support, suggesting that the pattern of relations between social emotional competence and achievement was similar across cultures. Analyses were unable to determine why certain competencies were (not) related to success, and whether these relations were causal in nature or due to other unmeasured variables.

Limitations and Recommendations

This dissertation had several important limitations. First, it relied on data already collected by MPS, and characteristics of this dataset limited this study's ability to address the research questions as deeply as originally hoped. Although Chapter Two advised against this approach, culture was operationally defined as a single characterization (membership in four separate groups: gender, race/ethnicity, home language, socioeconomic status) rather than a more complex construct accounting for students'

many dynamic identities. This approach may prove more practical for MPS by offering findings relevant to current classification systems, but it also has negative implications for research. If, for example, a student is classified within a group they do not closely identify with (e.g., classified as female but identifies as genderqueer/gender non-binary), their membership in that group will create "noise" or unreliability in the data. Future research may adopt other operational definitions of culture, such as using self-reports for cultural identities or creating one inclusive culture variable that accounts for students many interacting identities.

Timing of data collection was also a concern for this dissertation, for the HSA was administered in May 2016, which tended to be after or at the same time as the two focal outcome variables. This limits the study's ability to make meaningful conclusions about the relations between competence and success. For example, the MCA is administered to students between March and May each year. If a student completed the MCA in before the HSA, any changes in their level of social emotional competence occurring between assessments would show up on the HSA, but not on the MCA. Future research may address these challenges by designing a study and collecting data solely for the purpose of addressing these research questions. This would ensure that the predictor was measured before or simultaneously with the outcome, thereby strengthening conclusions.

This study analyzed data collected from a shortened version of the HSA. Although preliminary analyses found some evidence that the HSA was psychometrically sound, it is not without flaws. First, this version only included 15 items across 4 subscales, which may be too few to effectively measure students' skills. Next, the items

did not consistently follow best practices for item writing (see Dillman, Smyth, & Christian, 2014). For instance, the instructions did not prompt students to think about these items within a particular context (e.g., with friends, at school, at home), and some items were double barreled (e.g., "I say what I think even if adults or friends disagree"). This could have resulted in students interpreting the items differently or answering double barreled items inconsistently. In the example provided above, one student may have selected a response based on their behavior around friends, another may have focused on family, and yet another may have selected a more moderate response to address competing scores for behavior around friends versus family. This could have created unreliability in the data, for if students were not referencing the same contexts or information while responding, their scores may not truly reflect the same skill.

Finally, the content of these items raised questions about their ability to effectively measure the competencies as they were operationally defined. Empathy refers to one's ability to understand and share another's feelings. However, the empathy items on the HSA seemed to align more closely with pity (e.g., "When I see someone being bullied, I feel sorry for them"), for they did not address students' experience of other's emotions. Furthermore, as previously mentioned, the critical thinking items were not specific to an academic context, though educational research commonly refers to critical thinking as an academic skill. If these skills are either named or defined incorrectly, conclusions regarding their relationships with success may not be fully accurate. Taken together – and in consideration with a lack of construct validity evidence – these concerns about the HSA are especially problematic, for if it is not a sound measure of social emotional competence, this study's findings may be inaccurate and uninterpretable.

This research was founded on the argument that social emotional competence is not and cannot be simplified into one, neatly packaged set of universal skills. Instead, competence was thought to be a function of students' many cultural identities, with the norms and expectations of different cultures dictating students' emotions, behaviors, and social understandings. This hypothesis challenges the assumptions present in the literature, but this study's methods were not necessarily equipped to meet these demands. The HSA, along with other social emotional assessments, are based on the same assumptions this dissertation hoped to challenge, determining students' level of competence by asking them an identical set of questions, and assuming that particular responses to the items represent high and low social emotional skill levels and that the same set of skills play a role in healthy development for all students. In the future, qualitative findings may supplement quantitative work by offering research designs independent of these assumptions. Initially, this dissertation hoped to take this approach by asking culturally diverse families to define these four competencies and describe how valuable they are for their child's personal, academic, and life success. Unfortunately, challenges with scheduling and coordinating across several MPS departments prevented these focus groups from taking place in the allotted amount of time. Although qualitative work is not frequently utilized in educational research, it is invaluable in providing a strong foundation on which theories can be built.

Implications

Despite its limitations, this dissertation has important implications and recommendations for research and practice. These are described in greater detail below.

Implications for Research

This study offers two major contributions to the field. First, it emphasizes the importance of developing a thorough understanding of social emotional competence, including what skills are predictive of student outcomes and why. Though prior research has documented a relationship between social emotional competence and student success, many of these studies utilize participation in an intervention as the primary independent variable. This study, however, utilized students' skills (independent of an intervention) as the primary independent variables, finding very small and largely inconsistent relations between social emotional competence and student outcomes. This highlights the complex nature of the relationship between social emotional competence and student success, with different skills predicting different outcomes in different settings. By refocusing research on the theoretical foundations of competence – including a clear definition of competence, identification of important competencies, and connection between competencies and success outcomes – schools will be better able to implement these interventions and assessments, targeting skills based on desired outcomes and/or identifying why interventions were or were not successful.

This study also contributed to the field by providing initial support of the cultural approach to competence. This dissertation found: (a) some evidence of invariance in the interrelations between social emotional competencies, as measured by the HSA, (b) that some competencies were, in part, a function of their cultural backgrounds, and (c) that different social emotional competencies predicted student behavioral issues across different schools. Unfortunately, this research was unable to determine whether these relations resulted from limitations of the measure or were likely due to more theoretical

differences. Regardless, these findings highlight the importance of exploring culture in greater depth through a variety of techniques. For instance, researchers may focus on identifying the cultural relevance of social emotional competence – as currently defined in the literature, policy, and interventions – through the use qualitative research (e.g., focus groups or interviews with students, families, educators, etc.). Researchers may also take steps to ensure the cultural competence of social emotional assessments before implementing them in school systems or offering them as part of an intervention, and attempt to explain the relations between competencies and success outcomes across a variety of school settings. By ensuring social emotional work is equitable, researchers can improve educational experiences and outcomes for all students.

Implications for Policy and Practice

Policy. As described in Chapter One, social emotional competence has become increasingly prevalent in both federal and state policy. Many states have adopted social emotional standards for preK-12 education, and federal policies have proposed a consistent definition of competence as well as increased funding for research and professional development (CASEL, 2017a, b). These decisions are based conceptual models of competence that have, to date, failed to examine their relevance for different cultural groups, as well as studies that have not demonstrated the use of culturally relevant assessments or interventions.

As evidenced by this dissertation, social emotional competencies do not always predict student success outcomes; some competencies may have persistent effects, while others may only predict outcomes because they are confounded with unmeasured variables. Schools must be careful in selecting what competencies to target, focusing on

those that predict outcomes of interest. Unfortunately, researchers and policymakers have not offered schools much guidance in selecting particular competencies, and without the support and confidence of a large literature base, schools have limited information on which they can base these important decisions. Moving forward, policies should not encourage schools to use social emotional competencies in high-stakes evaluations or decisions (e.g., accountability), and should instead allow schools flexibility in both implementing social emotional tools and using social emotional data.

Practice. Although social emotional researchers admit that the field may have gotten ahead of itself (Kahn, 2013), school-based interventions and assessments are here to stay. School professionals must therefore be aware of this field's limitations, and without the aid of theoretically-sound and empirically-supported models of competence, use their expertise and knowledge of their students' and school cultures to ensure the work remains equitable. Professionals must remain critical – albeit constructively so – of these tools, and be willing to make adaptations when necessary. Finally, schools must be careful in their use of social emotional data, and refrain from using these far-from-perfect measures in high stakes decisions.

Conclusions

This dissertation utilized secondary data from a large, urban school district to: (a) understand the interrelationships between four social emotional competencies (assertiveness, critical thinking, emotional control, and empathy); (b) explore the role of culture in social emotional competence; (c) replicate findings from the literature, in which social emotional competence predicts important success outcomes; and (d) determine whether these relationships are invariant across cultural groups. Findings from

this work contribute to both research and practice, emphasizing the importance of understanding the complex relationships between culture, social emotional competence, and educational success and refocusing social emotional research from applications of competence to theoretical foundations. As social emotional competence interventions become more popular in American schools, state standards, and even federal policies, researchers must accept responsibility for ensuring their approaches benefit children from all backgrounds.

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Appendix A

Holistic Student Assessment

Student ID Number: _____

Student Questionnaire

This is a survey with no right or wrong answers. Please answer the following questions about yourself as honestly and thoroughly as you can.

If you have any questions, please raise your hand and ask your teacher for help.

For each of the following statements, please check the box that best describes what you think about the statement.

		Not at all	Some-times	Often	Almost always
1.	I stand up for things that matter to me.[a]	❑	❑	❑	❑
2.	When I see another kid who is hurt or upset, I feel sorry for them.[d]	❑	❑	❑	❑
3.	I try to look at a situation in different ways.[b]	❑	❑	❑	❑
4.	I tell people what I think.[a]	❑	❑	❑	❑
5.	If the way I'm doing something isn't working I try to think of different ways to do it.[b]	❑	❑	❑	❑
6.	I get into trouble because I say a lot of things that just come to my mind.[c]	❑	❑	❑	❑
7.	I say what I think even if adults or friends disagree.[a]	❑	❑	❑	❑
8.	When things don't go my way I quickly get really mad.[c]	❑	❑	❑	❑
9.	Other people's feelings matter to me.[d]	❑	❑	❑	❑
10.	I feel bad for other kids who are sad or have problems.[d]	❑	❑	❑	❑
11.	I stick up for myself against unfair rules.[a]	❑	❑	❑	❑
12.	I like to think of different ways to solve a problem.[b]	❑	❑	❑	❑
13.	I react to things so quickly I get in trouble.[c]	❑	❑	❑	❑
14.	I like to figure out how things work.[b]	❑	❑	❑	❑
15.	When I see someone being bullied, I feel sorry for them.[d]	❑	❑	❑	❑

Note. [a] = Assertiveness; [b] = Critical Thinking; [c] = Emotional Control; [d] = Empathy

Appendix B

Correlation Analyses: Achievement and Discipline

This appendix summarizes results from preliminary correlation analyses, examining the relations between student background characteristics, achievement, and discipline. Correlations can be found in Table A1.

Achievement

Three achievement variables were included in preliminary correlation analyses: GPA, mathematics growth z-scores, and reading growth z-scores. GPA was positively correlated with age (r = .21, p < .001), as well as mathematics (r = .14, p < .001) and reading (r = .16, p < .001) MCA growth, suggesting that older students and those who experienced more growth on the MCA tended to have higher GPAs. Students with more behavior infractions (r = -.11, p = .001) and male (r = -.11, p < .001), African American (r = -.22, p < .001), Hispanic (r = -.11, p < .001), Spanish speaking (r = -.12, p < .001), FRL eligible (r = -.28, p < .001), and HHM (r = -.14, p < .001) students tended to have lower GPAs than their counterparts. Students' growth on both the math and reading MCA were also correlated with several background variables. African American students (r = -.19, p < .001; r = -.13, p < .001 for math and reading, respectively), those eligible for FRL (r = -.25, p < .001; r = -.21, p < .001 for math and reading, respectively), those with more behavior infractions (r = -.13, p = .001 for reading), and those with more suspensions (r = -.12, p = .002 for math) tended to experience less growth on the MCA.

Discipline

Student discipline, as measured by the total number of behavior infractions and total number of suspensions, was also correlated with student background variables. Older students (r = .11, p < .001 for suspensions), African American students (r = .11, p

< .001; $r = .16$, $p < .001$ for infractions and suspensions, respectively), and students eligible for FRL ($r = .12$, $p < .001$ for suspensions) were more likely to exhibit behavioral issues than their counterparts, whereas Hispanic students ($r = -.11$, $p = .001$ for suspensions) exhibited fewer behavioral issues.

Table A1. Correlations among Background Variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Age	1								
2. Male	.01	1							
3. African American	.04**	.03*	1						
4. American Indian	-.01	-.04**	-.11***	1					
5. Asian	-.06***	-.01	-.21***	-.05**	1				
6. Hispanic	-.02	.01	-.31***	-.07***	-.13***	1			
7. Hmong HL	.06***	.00	-.13***	-.03*	.65***	-.09***	1		
8. Somali HL	.08***	.01	.50***	-.06***	-.10***	-.15***	-.07***	1	
9. Spanish HL	-.02	-.01	-.28***	-.05***	-.12***	.84***	-.08***	-.14***	1
10. Other HL	.04**	.01	.09***	-.03*	.15***	-.08***	-.04**	-.07***	-.08***
11. FRL	.02*	.01	.45***	.10***	.07***	.24***	.14***	.28***	.28***
12. HHM	-.02	.01	.21***	.07***	-.06***	-.03**	-.04**	.04**	-.04**
13. Days Enrolled	-.03*	-.03*	-.16***	-.01	.01	.01	.01	-.07***	.04**
14. GPA	.21***	-.11***	-.22***	-.09***	.10***	-.11***	.07***	-.08***	-.12***
15. MCA Math Growth	-.04**	-.03	-.19***	-.04*	.01	-.07***	-.03	-.08***	-.07***
16. MCA Reading Growth	-.02	-.04**	-.13***	-.06***	.01	-.08***	-.02	-.05**	-.09***
17. Behavior Infractions	-.02	.03	.11***	.01	-.03	-.07*	-.03	-.01	-.08**
18. Total Suspensions	.11***	-.05	.16***	.02	-.05	-.11**	.00	-.04	-.11***

Note. *$p < .05$, **$p < .01$, ***$p < .001$.

Table A1 Continued

	10.	11.	12.	13.	14.	15.	16.	17.
11. FRL	.09***	1						
12. HHM	-.03*	.20***	1					
13. Days Enrolled	-.04**	-.12***	-.17***	1				
14. GPA	.00	-.28***	-.14***	.07***	1			
15. MCA Math Growth	.00	-.25***	-.05**	.06***	.14***	1		
16. MCA Reading Growth	.01	-.21***	-.06***	.00	.16***	.30**	1	
17. Behavior Infractions	-.03	.05	-.02	.03	-.11**	-.03	-.13**	1
18. Total Suspensions	-.04	.12***	.08*	-.05	-.07*	-.12**	-.06	.22***

Note. *$p < .05$, **$p < .01$, ***$p < .001$.

Appendix C

Research Question 2: Regression Analysis Results

Assertiveness

Table A2. Regression Analysis Summary for Student Background Predicting Assertiveness: 4th Grade

	B	**SE *B***	***β***	***t***	***p***
Male	.00	.03	.00	.04	.969
African American	.07	.05	.05	1.44	.149
American Indian	-.06	.09	-.01	-.60	.549
Asian	-.09	.08	-.03	-1.04	.300
Hispanic	-.08	.06	-.05	-1.27	.206
FRL	-.08	.04	-.07	-1.97	.049
Hmong Home Language	-.12	.12	-.03	-1.04	.296
Somali Home Language	-.07	.06	-.03	-1.14	.253
Spanish Home Language	-.01	.07	-.01	-.12	.902
Other Home Language	.00	.10	.00	.03	.975

Note. Adjusted R^2 = .009, N = 2055

Table A3. Regression Analysis Summary for Student Background Predicting Assertiveness: 6th Grade

	B	**SE *B***	***β***	***t***	***p***
Male	-.07	.03	-.05	-2.16	.031
African American	.03	.05	.03	.66	.507
American Indian	.10	.11	.02	.92	.360
Asian	-.05	.08	-.02	-.67	.506
Hispanic	.01	.09	.00	.07	.943
FRL	-.10	.05	-.08	-2.29	.022
Hmong Home Language	-.29	.12	-.08	-2.50	.013
Somali Home Language	.03	.06	.02	.52	.601
Spanish Home Language	-.20	.09	-.10	-2.16	.031

	B	SE *B*	*β*	*t*	*p*
Other Home Language	-.02	.09	-.01	-.23	.817

Note. Adjusted R^2 = .028, N = 1692

Table A4. Regression Analysis Summary for Student Background Predicting Assertiveness: 8th Grade

	B	SE *B*	*β*	*t*	*p*
Male	-.01	.03	-.01	-.36	.720
African American	.07	.05	.05	1.31	.190
American Indian	-.14	.10	-.04	-1.36	.175
Asian	-.14	.08	-.06	-1.76	.079
Hispanic	-.12	.10	-.07	-1.19	.236
FRL	-.13	.05	-.10	-2.67	.008
Hmong Home Language	.10	.12	.03	.81	.419
Somali Home Language	.02	.06	.01	.31	.759
Spanish Home Language	.03	.11	.02	.26	.797
Other Home Language	.05	.09	.02	.60	.548

Note. Adjusted R^2 = .014, N = 1523

Table A5. Regression Analysis Summary for Student Background Predicting Assertiveness: 10th Grade

	B	SE *B*	*β*	*t*	*p*
Male	.00	.04	.00	.01	.993
African American	.01	.06	.00	.08	.937
American Indian	.02	.15	.00	.14	.886
Asian	-.01	.09	.00	-.05	.958
Hispanic	-.06	.12	-.04	-.54	.591
FRL	-.01	.05	-.01	-.13	.893
Hmong Home Language	-.08	.12	-.03	-.69	.489
Somali Home Language	-.07	.07	-.04	-1.05	.296
Spanish Home Language	-.08	.13	-.04	-.64	.525

	B	SE *B*	*β*	*t*	*p*
Other Home Language	-.09	.10	-.03	-.88	.38

Note. Adjusted R^2 = -.001, N = 1229

Critical Thinking

Table A6. Regression Analysis Summary for Student Background Predicting Critical Thinking: 4th Grade

	B	SE *B*	*β*	*t*	*p*
Male	-.05	.03	-.04	-1.73	.083
African American	-.10	.05	-.07	-2.05	.040
American Indian	-.22	.09	-.06	-2.36	.018
Asian	.01	.08	.00	.15	.884
Hispanic	-.01	.06	-.00	-.10	.923
FRL	-.13	.04	-.10	-2.98	.003
Hmong Home Language	-.17	.12	-.04	-1.41	.159
Somali Home Language	.06	.06	.03	1.04	.297
Spanish Home Language	.00	.07	.00	.05	.964
Other Home Language	-.04	.10	-.01	-.39	.700

Note. Adjusted R^2 = .021, N = 2054

Table A7. Regression Analysis Summary for Student Background Predicting Critical Thinking: 6th Grade

	B	SE *B*	*β*	*t*	*p*
Male	-.05	.03	-.04	-1.72	.085
African American	-.13	.05	-.09	-2.50	.013
American Indian	.06	.11	.01	.51	.612
Asian	-.06	.08	-.02	-.74	.458
Hispanic	.00	.09	.00	-.04	.971
FRL	-.09	.05	-.07	-2.02	.043
Hmong Home Language	-.08	.12	-.02	-.67	.505

	B	SE *B*	*β*	*t*	*p*
Somali Home Language	.25	.06	.12	4.30	.000
Spanish Home Language	-.06	.09	-.03	-.65	.517
Other Home Language	.14	.09	.04	1.54	.125

Note. Adjusted R^2 = .017, N = 1689

Table A8. Regression Analysis Summary for Student Background Predicting Critical Thinking: 8th Grade

	B	SE *B*	*β*	*t*	*p*
Male	.00	.03	.00	-.01	.994
African American	-.08	.06	-.06	-1.46	.144
American Indian	-.35	.10	-.10	-3.39	.001
Asian	-.07	.09	-.03	-.78	.434
Hispanic	-.09	.10	-.05	-.90	.369
FRL	-.11	.05	-.08	-2.31	.021
Hmong Home Language	.30	.13	.08	2.31	.021
Somali Home Language	.13	.07	.06	1.92	.056
Spanish Home Language	.03	.11	.02	.27	.791
Other Home Language	.17	.09	.05	1.87	.062

Note. Adjusted R^2 = .021, N = 1519

Table A9. Regression Analysis Summary for Student Background Predicting Critical Thinking: 10th Grade

	B	SE *B*	*β*	*t*	*p*
Male	.03	.04	.03	.90	.370
African American	-.16	.06	-.12	-2.69	.007
American Indian	-.09	.14	-.02	-.64	.525
Asian	-.23	.09	-.12	-2.55	.011
Hispanic	-.06	.11	-.03	-.49	.623
FRL	-.09	.05	-.07	-1.74	.082
Hmong Home Language	.23	.11	.09	2.07	.039

	B	SE *B*	*β*	*t*	*p*
Somali Home Language	.21	.07	.11	3.10	.002
Spanish Home Language	-.06	.12	-.03	-.46	.643
Other Home Language	.14	.10	.05	1.46	.144

Note. Adjusted R^2 = .017, N = 1229

Emotional Control

Table A10. Regression Analysis Summary for Student Background Predicting Emotional Control: 10th Grade

	B	SE *B*	*β*	*t*	*p*
Male	-.14	.04	-.09	-3.37	.001
African American	-.42	.07	-.25	-5.76	.000
American Indian	-.41	.17	-.07	-2.46	.014
Asian	-.18	.11	-.07	-1.71	.088
Hispanic	.10	.13	.05	.72	.473
FRL	-.17	.06	-.11	-2.81	.005
Hmong Home Language	.41	.13	.13	3.10	.002
Somali Home Language	.20	.08	.08	2.50	.013
Spanish Home Language	-.32	.14	-.15	-2.28	.023
Other Home Language	-.07	.12	-.02	-.60	.550

Note. Adjusted R^2 = .092, N = 1228

Empathy

Table A11. Regression Analysis Summary for Student Background Predicting Empathy: 4th Grade

	B	SE *B*	*β*	*t*	*p*
Male	-.22	.03	-.17	-8.17	.000
African American	-.23	.05	-.17	-5.00	.000
American Indian	-.38	.09	-.10	-4.20	.000
Asian	-.14	.08	-.05	-1.73	.083

	B	SE *B*	*β*	*t*	*p*
Hispanic	-.05	.06	-.03	-.82	.411
FRL	-.17	.04	-.13	-4.20	.000
Hmong Home Language	-.04	.11	-.01	-.37	.711
Somali Home Language	.08	.06	.03	1.40	.162
Spanish Home Language	-.08	.06	-.04	-1.18	.236
Other Home Language	.13	.09	.03	1.44	.150

Note. Adjusted R^2 = .095, N = 2056

Table A12. Regression Analysis Summary for Student Background Predicting Empathy: 6th Grade

	B	SE *B*	*β*	*t*	*p*
Male	-.27	.03	-.20	-8.54	.000
African American	-.36	.05	-.24	-6.75	.000
American Indian	-.22	.11	-.05	-1.92	.055
Asian	-.16	.08	-.06	-1.99	.047
Hispanic	-.14	.09	-.07	-1.62	.106
FRL	-.15	.05	-.11	-3.19	.001
Hmong Home Language	-.17	.12	-.04	-1.44	.149
Somali Home Language	.19	.06	.09	3.20	.001
Spanish Home Language	-.08	.10	-.04	-.85	.394
Other Home Language	.16	.09	.04	1.82	.070

Note. Adjusted R^2 = .115, N = 1690

Table A13. Regression Analysis Summary for Student Background Predicting Empathy: 8th Grade

	B	SE *B*	*β*	*t*	*p*
Male	-.31	.04	-.20	-8.39	.000
African American	-.35	.06	-.22	-5.92	.000
American Indian	-.45	.11	-.11	-4.08	.000
Asian	-.21	.09	-.08	-2.32	.020

	B	SE *B*	*β*	*t*	*p*
Hispanic	-.14	.11	-.07	-1.28	.200
FRL	-.19	.05	-.13	-3.68	.000
Hmong Home Language	.20	.14	.04	1.43	.153
Somali Home Language	.25	.07	.10	3.52	.000
Spanish Home Language	.05	.12	.02	.39	.699
Other Home Language	.29	.10	.08	2.95	.003

Note. Adjusted R^2 = .115, N = 1521

Table A14. Regression Analysis Summary for Student Background Predicting Empathy: 10th Grade

	B	SE *B*	*β*	*t*	*p*
Male	-.30	.04	-.20	-7.35	.000
African American	-.27	.07	-.17	-3.91	.000
American Indian	-.16	.16	-.03	-1.03	.301
Asian	-.25	.10	-.11	-2.48	.013
Hispanic	-.17	.13	-.09	-1.34	.182
FRL	-.31	.06	-.20	-5.31	.000
Hmong Home Language	.19	.13	.06	1.49	.136
Somali Home Language	.20	.08	.09	2.67	.008
Spanish Home Language	.00	.14	.00	-.03	.980
Other Home Language	.15	.11	.04	1.38	.167

Note. Adjusted R^2 = .117, N = 1229

Appendix D

Research Question 3: Cultural Variation HLM Results

Mathematics

Table A15. Cultural Variation Model Coefficients: MCA Mathematics Growth

Fixed Effects	Coefficient	Standard Error	*t* value
Level 2: Schools			
Intercept	-.04	.07	-.60
Racial Isolation	-.11	.10	-1.11
Level 1: Individuals			
Assertiveness	.04	.03	1.36
Critical Thinking	.06	.03	2.11*
Emotional Control	.14	.02	6.75***
Empathy	.02	.03	.78
African American * Critical Thinking	-.03	.07	-.37
American Indian * Critical Thinking	-.07	.14	-.51
Asian * Critical Thinking	.18	.09	1.94[a]
Hispanic * Critical Thinking	-.14	.08	-1.83[a]
FRL * Critical Thinking	-.06	.06	-.94
African American * Emotional Control	-.07	.06	-1.29
American Indian * Emotional Control	.20	.12	1.68[a]
Asian * Emotional Control	.00	.08	-.05
Hispanic * Emotional Control	-.04	.06	-.62
FRL * Emotional Control	.00	.05	.02
Grade	.04	.01	3.30***
Male vs. Female	.01	.03	.30
African American vs. White	-.19	.05	-3.82***
American Indian vs. White	-.03	.10	.16
Asian vs. White	.05	.08	.61
Hispanic vs. White	-.10	.07	-1.31
Hmong vs. English Home Language	-.10	.11	-.97
Somali vs. English Home Language	.04	.06	.59
Spanish vs. English Home Language	-.03	.08	-.44
Other vs. English Home Language	.15	.09	1.79

Fixed Effects	Coefficient	Standard Error	*t* value
FRL Eligibility	.13	.05	2.80**
Gifted/Talented	.31	.04	8.29***
Special Education	.14	.05	2.88**
Homeless/Highly Mobile	-.11	.08	-1.38
Enrolled Days AY 2015-2016	.00	.00	1.24

Note. *$p < 0.05$, **$p < .01$, ***$p < .001$, [a]$p < .10$. All variables, including dummy coded and dichotomous variables, were grand mean centered.

Reading

Table A16. Cultural Variation Model Coefficients: MCA Reading Growth

Fixed Effects	Coefficient	Standard Error	*t* value
Level 2: Schools			
Intercept	-.03	.06	-.53
Racial Isolation	-.08	.08	-1.01
Level 1: Individuals			
Assertiveness	.05	.03	1.87[a]
Critical Thinking	-.01	.03	-.37
Emotional Control	.12	.02	5.52***
Empathy	.02	.03	.73
Gender * Assertiveness	.01	.05	.17
African American * Assertiveness	-.07	.07	-.90
American Indian * Assertiveness	.01	.15	.05
Asian * Assertiveness	-.08	.12	-.67
Hispanic * Assertiveness	.13	.11	1.23
FRL * Assertiveness	-.09	.07	-1.30
Hmong * Assertiveness	-.02	.18	-.11
Somali * Assertiveness	.07	.09	.76
Spanish * Assertiveness	-.29	.12	-2.47*
Other * Assertiveness	.17	.13	1.26
Gender * Emotional Control	-.02	.04	-.51
African American * Emotional Control	-.07	.06	-1.11
American Indian * Emotional Control	-.18	.12	-1.48

Fixed Effects	Coefficient	Standard Error	*t* value
Asian * Emotional Control	-.08	.10	-.86
Hispanic * Emotional Control	.00	.10	.03
FRL * Emotional Control	-.03	.05	-.59
Hmong * Emotional Control	-.11	.15	-.73
Somali * Emotional Control	.02	.07	.35
Spanish * Emotional Control	-.05	.10	-.44
Other * Emotional Control	.06	.10	.59
Grade	.03	.01	2.54*
Male vs. Female	-.03	.03	-1.06
African American vs. White	-.14	.05	-2.53*
American Indian vs. White	-.23	.10	-2.28*
Asian vs. White	.06	.08	.77
Hispanic vs. White	-.08	.07	-1.03
Hmong vs. English Home Language	-.04	.12	-.33
Somali vs. English Home Language	.09	.07	1.33
Spanish vs. English Home Language	-.08	.08	-.92
Other vs. English Home Language	.21	.09	2.24*
FRL Eligibility	.17	.05	3.65***
Gifted/Talented	.32	.04	8.23***
Special Education	.14	.05	2.80**
Homeless/Highly Mobile	.06	.09	.66
Enrolled Days AY 2015-2016	.00	.00	-1.87[a]

Note. *$p < 0.05$, **$p < .01$, ***$p < .001$, [a]$p < .10$. All variables, including dummy coded and dichotomous variables, were grand mean centered.

Appendix E

Research Question 4: Logistic Regression Results within School

This appendix presents detailed results from the logistic regression models predicting student referrals with social emotional competencies and student background characteristics. Table 24 (p. 118) provides the student characteristics of each school, and Table 25 (pp. 119-120) provides a summary of regression results for all seven models.

School 3

School 3 included 355 students, 94 (26.5%) of whom received at least one referral during the 2015-2016 AY. Student characteristics – including all control variables included in prior models – can be found in Table 24. A few alterations to the model were required given sample characteristics. First, the two American Indian students were excluded from analyses, as the category was too small for reliable analyses and there was no "other" category in which these students could be subsumed. The two students who spoke Hmong were recategorized with the "other/unknown" home language category, and HHM was excluded from analyses given its small frequency. Otherwise, all variables in Table 24 were included in the model. These variables were dummy coded when necessary, with female, White race/ethnicity, English home language, non-FRL eligible, not enrolled in special education services, and not gifted/talented serving as the reference groups.

Results of the regression are summarized in Table 25. The control model provided a good fit to the data [$\chi^2(11) = 130.63$, $p < .001$], explaining 45% of the variance in student referrals and correctly classifying 81.3% of cases. Adding the four social emotional variables improved model fit [$\chi^2(4) = 51.56$, $p < .001$], explaining 59% of the

variance in referrals and correctly classifying 85.8% of cases (93.1% of non-referred, 65.5% of referred). Thus, the social emotional model was most appropriate for the data.

Within the social emotional model, five background variables significantly predicted student referrals: gender (B = 1.28, Wald = 11.51, p =.001), Somali vs. English home language (B = 1.61, Wald = 8.68, p =.003), FRL eligibility (B = 1.16, Wald = 5.26, p =.022), gifted/talented (B = -1.47, Wald = 5.07, p =.024), and special education enrollment (B = -1.26, Wald = 5.78, p =.016). Male students were 3.61 times more likely to be referred than females, Somali-speakers were 4.99 times more likely to be referred than English-speakers, and FRL eligible students were 3.18 times more likely to be referred than non-eligible students. The remaining two predictors - Gifted/talented and special education enrollment – were negative predictors of referrals, such that students in these groups were 77% and 72% less likely to be referred than their non-gifted/talented and traditional education counterparts, respectively.

Both emotional control (B = -.89, Wald = 14.07, p < .001) and empathy (B = -1.49, Wald = 20.72, p < .001) significantly predicted student referrals, while assertiveness (B = .24, Wald = .51, p = .474) and critical thinking (B = -.16, Wald = .19, p = .667) showed non-significant results. A one-unit increase in emotional control was associated with 59% decrease in the likelihood of receiving a referral, while a one-unit increase in empathy was associated with a 77% decrease.

Binary logistic regression is not founded on the same set of assumptions as traditional regression (see Chapter Four), but requires its own set of assumptions. First, the dependent variable must be binary, and coded such that the probability of the outcome occurring = 1 (i.e., referral = 1). Next the model must be fit correctly, which

requires the inclusion of meaningful (and exclusion of unimportant) variables; this involves selecting theoretically and statistically relevant predictors and using a stepwise method to test model fit. Next, logistic regression requires that the observations are independent of one another, which is a function of the research design (e.g., no matched pairs or pre-post measures). Finally, there must be a linear relationship between the (continuous) independent variables and log odds, which was confirmed by plotting the log odds against each of the four social emotional constructs. Because the model met all assumptions, it was considered a good fit to the data.

In sum, two social emotional competencies – emotional control and empathy – significantly predicted student referrals among middle schoolers attending School 3. Greater emotional control and empathy were negatively associated with referrals, with a one unit increase in each skill resulting in a 59% and 77% decrease in the likelihood of being referred, respectively. Certain background variables were also predictive of student referrals; males, Somali-speaking students, and FRL eligible students were more likely to be referred than their female, English-speaking, and non-FRL eligible peers, while gifted/talented and special education students were less likely to be referred than their traditional education counterparts.

School 4

Next, this model was replicated within school 4. School 4 included 316 students, 30 (9.5%) of whom had been referred at least once. Student characteristics are available in Table 24. Though I planned to include the same predictors as in prior models, school characteristics required a few alterations. The American Indian and Asian students were grouped into one "other race/ethnicity" category, as were the Somali and Hmong home

language students. Furthermore, both HHM and gifted/talented status were removed from the model due to their low frequency. Again, all variables in Table 24 were included in the model, and categorical variables were dummy coded following the same method described in the school 3 analyses.

Regression results are available in Table 25. A chi-square test of the control model found statistically significant results [$\chi^2(14) = 50.07$, $p < .001$]. The control model explained 32% of the variance in student referrals, and correctly classified 90.5% of cases, though no "referred" cases were classified correctly (i.e., all cases were classified as 0, or no referral, within the model). Interestingly, the addition of the four social emotional variables did not improve model fit. Although these constructs explained a small percentage of variance above and beyond traditional predictors (Nagelkerke's $R^2 = .36$), the chi-square test found non-significant results [$\chi^2(4) = 2.80$, $p = .591$], and the model was unable to correctly classify any more cases than the control model (i.e., the model still classified 100% of cases as 0, or no referral). This suggested that social emotional competence was not predictive of student referrals within school 4.

As can be seen in Table 25, even though the chi-square test of the control model suggested that the control model fit the data, none of the control variables significantly predicted student referrals. None of the four social emotional constructs predicted student referrals either, a finding that is not surprising when considered in light of the model fit statistics provided above. Overall, the control model met all assumptions, including: binary outcome variable, probability of referrals coded as Y = 1, appropriate model fit, independence of observations, and linear relationship between continuous independent variables and log odds.

Unlike the prior analysis, the logistic regression modeling school 4 referrals found no evidence of a relationship between social emotional competence and student disciplinary issues. The control model, which included traditional predictors of discipline such as race/ethnicity and gender, provided a decent fit to the data despite finding no statistically significant predictors. Thus, although the control model fit the data by certain statistical standards, this model provided no practical information regarding who is referred and why within school 4.

School 15

I then fit the regression model to the 245 students within school 15. Forty-five (18.4%) of these students had been referred at least once during the 2015-2016 AY. Demographic characteristics of the school (see Table 24) required a few model modifications. First, American Indian, Hispanic, and Asian students were categorized into one "other race/ethnicity" category due to their small frequencies. The HHM and home language variables were also removed, for only 6.3% of students were identified as HHM and over 97% of students at School 5 spoke English at home. All categorical variables were dummy coded before they were entered in the model.

I then fit the model, following the same approach as prior analyses. Regression results are summarized in Table 25. The control model provided a good fit to the data [$\chi^2(14) = 85.07$, $p < .001$], explaining 48% of the variance in student referrals, and correctly classifying 86.1% of cases. Students' social emotional competence – including assertiveness, critical thinking, emotional control, and empathy – explained an additional 6% of the variance in student referrals (Nagelkerke's $R^2 = .54$), and increased the percentage of correct classifications (87.3% overall; 95.0% non-referred, 53.3% referred).

In concert with statistically significant results from a chi-square test [$\chi^2(4) = 14.76$, $p = .005$], this evidence suggested that this model provided a better fit to the data than the control model.

Three control variables in the social emotional model significantly predicted student referrals: gender ($B = 2.26$, Wald = 12.47, $p < .001$), race/ethnicity (African American: $B = 1.44$, Wald = 4.47, $p = .035$), and FRL eligibility ($B = 1.46$, Wald = 5.66, $p = .017$). Males were 9.61 times more likely to be referred than females, African American students were 4.21 times more likely to be referred than White students, and FRL eligible students were 4.75 times more likely to be referred than non-eligible students. Emotional control ($B = -.96$, Wald = 9.37, $p = .002$) and empathy ($B = -.87$, Wald = 4.57, $p = .033$) were also significant predictors of student referrals, with a one unit increase in emotional control and one unit increase in empathy resulting in a 61% and 58% decrease in the likelihood of being referred, respectively. Neither assertiveness ($B = .033$, Wald = .006, $p = .940$) nor critical thinking ($B = .41$, Wald = .67, $p = .413$) significantly predicted referrals. Overall, this model met all assumptions (see description in School 3), including: binary outcome variable, probability of referrals coded as Y = 1, appropriate model fit, independence of observations, and linear relationship between continuous independent variables and log odds.

Only two social emotional competencies – emotional control and empathy – were negative predictors of student referrals within school 15, with a one unit increase in both skills resulting in a 61% and 58% decrease in the likelihood of receiving a referral, respectively. Three background variables also predicted referrals, such that male, African

American, and FRL eligible students were significantly more likely to be referred than female, White, and non-eligible students.

School 33

The regression model was again replicated within School 33. School 33 included 284 students, 52 (18.3%) of whom had received at least one referral. School characteristics (see Table 24) required only two modifications to the model. First, Hmong and Somali home language students were grouped in the "other/unknown" category. Next, the HHM variable was excluded from analyses, as it was only applicable to 5.6% of students. All categorical variables were dummy coded before being entered into the model.

The regression model was then fit to the data, following the same procedure described above. A summary of regression results is available in Table 25. The control model provided a good fit to the data, as evidenced by a statistically significant chi-square test [$\chi^2(14) = 61.14$, $p < .001$], Nagelkerke's R^2, and a classification table. The control model explained 32% of the variance in student referrals, and correctly classified 82.7% of cases. The inclusion of social emotional competence accounted for an additional 6% of the variance (Nagelkerke's $R^2 = .38$) in student referrals, and increased the model's performance by correctly classifying 84.2% of cases. Upon further examination of the classification table, however, I found that the inclusion of social emotional competence slightly decreased the model's accuracy for non-referred students (97.8% vs. 95.3%), but notably increased its accuracy for referred students (15.4% vs. 34.6%). When taken in consideration with a statistically significant chi-square test [$\chi^2(4)$

= 14.06, p = .007], and increase in explained variance, I concluded that the social emotional competence provided the best fit to the data.

Race/ethnicity (African American: B = 1.80, Wald = 8.40, p = .004), home language (Other: B = -1.53, Wald = 4.90, p = .027), and special education enrollment (B = .96, Wald = 3.89, p = .049) significantly predicted referrals within the social emotional model. African American students were 6.06 times more likely to be referred than White students and special education students were 2.62 times more likely to be referred than traditional education students. Interestingly, however, students who spoke Somali, Hmong, or other languages at home (new "other" category for this school) were 78% less likely to be referred than their English-speaking counterparts.

Two social emotional competencies significantly predicted referrals. Critical thinking was a positive predictor (B = .87, Wald = 4.14, p = .042), such that a one unit increase in critical thinking was associated with 2.38 times greater likelihood of being referred. In contrast, emotional control was a negative predictor of referrals (B = -.71, Wald = 8.74, p = .003), with a one-unit increase in emotional control resulting in a 51% decrease in the likelihood of being referred. Assertiveness (B = -.25, Wald = .55, p = .459) and empathy (B = -.64, Wald = 3.74, p = .053) did not predict student referrals. Overall, this model met all assumptions (see description in School 3), including: binary outcome variable, probability of referrals coded as Y = 1, appropriate model fit, independence of observations, and linear relationship between continuous independent variables and log odds.

Whereas two of the three prior models found both emotional control and empathy to be predictive of student referrals, emotional control and critical thinking predicted

referrals in the present model. Interestingly, the relationship between critical thinking and referrals was positive, with a one-unit increase in referrals resulting in 2.38 times greater odds of being referred. Consistent with prior findings, the relationship between emotional control and referrals was negative, with a one-unit increase in emotional control resulting in a 51% decrease in the likelihood of being referred. African American and special education students were more likely to be referred, while students who spoke Somali, Hmong, or other languages at home were less likely to be referred.

School 35

A total of 110 students in school 35 completed the survey, and 11 (10%) of these students were referred at least once. Sample characteristics (see Table 24) necessitated some alterations to the model. Race/ethnicity was removed entirely, for the majority of students were African American. Home language was also removed from the sample, as most students within School 3 spoke English. Finally, FRL eligibility, gifted/talented, and HHM were excluded from analyses due to their low frequencies. Thus, the regression model for school 35 only included three control variables (i.e., gender, special education enrollment, enrolled days). Both gender and special education were dummy coded before being entered into the model.

Regression results can be found in Table 25. The control variables only explained 12% of the variance in student referrals. Though this model correctly classified 90% of cases, all cases were classified as "no referral." Not surprisingly, a chi-square test found non-significant results [$\chi^2(3) = 6.26$, $p = .100$], suggesting that this model did not fit the data. Interestingly, however, the addition of the four social emotional competencies significantly improved model fit [$\chi^2(4) = 12.28$, $p = .015$], explaining an additional 20%

of the variance in student referrals (Nagelkerke's R^2 = .32). The classification rate remained at 90%, but the model correctly classified 9.1% of referred students (vs. 0% of referred students in the control model), thereby increasing the model's accuracy. This evidence indicated that the social emotional model provided the best fit to the data, and student referrals were, in part, a function of their social emotional competence.

None of the control variables and only one social emotional variable (emotional control; B = -1.36, Wald = 5.18, p = .023) predicted student referrals. A one unit increase in emotional control resulted in a 74% decrease in the likelihood of being referred within school 35. Neither assertiveness (B = 1.31, Wald = 2.61, p = .106), critical thinking (B = -1.26, Wald = 2.75, p = .097), nor empathy (B = -.38, Wald = .46, p = .497) predicted referrals. Overall, this model met all assumptions (see description in School 3), including: binary outcome variable, probability of referrals coded as Y = 1, appropriate model fit, independence of observations, and linear relationship between continuous independent variables and log odds.

This analysis had rather interesting results. Although the control model did not fit the data, the social emotional model significantly increased model fit and accuracy, implying that social emotional competence was an important predictor of student referrals with school 35. Emotional control was the only social emotional competency that found statistically significant results, with a one-unit increase in emotional control resulting in a 74% decrease in the likelihood of being referred. Otherwise, none of the remaining variables – including the three control variables – predicted student referrals.

School 38

Next, I replicated the model among the 367 students attending School 38. Thirty-two (8.7%) of these students were referred one or more times during the 2015-2016 AY. Given the large and diverse sample within this school (see Table 24), only a few model modifications were required. American Indian and Asian students were grouped into one "other race/ethnicity" category, and the one Hmong-speaking student was grouped with the "other/unknown home language" category. Finally, the HHM variable was excluded from the sample, as it only impacted 3.8% of students. All categorical variables were dummy coded before they were entered into the model.

I then fit the model to the data, first entering control variables and later adding the social emotional variables. Table 25 provides a summary of regression results. The control model provided an adequate fit to the data [$\chi^2(11) = 30.14$, $p = .002$], explaining about 18% of the variance in student referrals, and correctly classifying 91.4% of cases (though it only correctly classified 3.2% of referred cases). The inclusion of social emotional competence only accounted for an additional 2% of the variance (Nagelkerke's $R^2 = .20$) in student referrals, and < 1% increase in model accuracy. When taken in consideration with non-significant results from a chi-square test [$\chi^2(4) = 2.76$, $p = .599$], I concluded that the control model provided the best fit, and that social emotional competence, as measured by the HSA, had no measurable relation with student referrals within school 38.

Although the control model seemed to fit the data, no control variables – including gender, race/ethnicity, home language, FRL eligibility, gifted/talented, special education, and total number of days enrolled in MPS – significantly predicted student

referrals. The control model met all assumptions (see description in School 3), including: binary outcome variable, probability of referrals coded as Y = 1, appropriate model fit, independence of observations, and linear relationship between continuous independent variables and log odds.

Social emotional competence was not predictive of student referrals within school 38. Although evidence from Nagelkerke's R^2 and chi-square tests suggested that the control model seemed to provide an adequate fit to the data, no control variables were predictive of referrals within the model. This finding is not surprising when considered in tandem with model accuracy (i.e., classification tables), for the control model only correctly classified 3.2% of referred students. Thus, the present model provided little, if any, practical information regarding who is referred (and why) within school 38.

School 40

This model was replicated one last time among the 381 middle school students attending school 40. Ninety-three (24.4%) of these students had at least one behavior referral. Given the large and diverse sample within school 40, only two modifications were required. First, the one Hmong-speaking student was recategorized as "other/unknown" home language. Next, HHM was excluded from the model given its low frequency (5.2%). All categorical variables were dummy coded before they were entered into the model.

I then fit the regression model, first including only control variables, and later adding social emotional competencies. Regression results are available in Table 25. The control variables accounted for 20% of the variance in student referrals, and the model correctly classified 77.6% of cases. Though this percentage seems low, the model

correctly classified 20.4% of students who had referrals, and 96.2% of students who did not have a referral. Taken in tandem with statistically significant results from a chi-square test [$\chi^2(12) = 54.42$, $p < .001$], evidence suggested that the control model provided a good fit to the data. Social emotional competence explained an additional 10% of the variance in referrals (Nagelkerke's $R^2 = .30$), and increased model accuracy (80.5% overall; 94.1% not referred, 38.7% referred). Not surprisingly, a chi-square test found statistically significant results [$\chi^2(4) = 31.42$, $p < .001$], suggesting the social emotional model fit the data better than the control model.

Gender ($B = 1.22$, Wald = 17.39, $p < .001$) was the only control variable that significantly predicted student referrals, such that males were 3.40 times more likely to be referred than females. Both emotional control ($B = -.74$, Wald = 16.10, $p < .001$) and empathy ($B = -.72$, Wald = 8.35, $p = .004$) were negative predictors of student referrals, with a one-unit increase in emotional control resulting in a 52% decrease in the likelihood of being referred and a one unit increase in empathy resulting in a 49% decrease in likelihood. Neither assertiveness ($B = .20$, Wald = .45, $p = .501$) nor critical thinking ($B = -.02$, Wald = .01, $p = .939$) predicted retention. Overall, the social emotional model met all assumptions (see description in School 3), including: binary outcome variable, probability of referrals coded as Y = 1, appropriate model fit, independence of observations, and linear relationship between continuous independent variables and log odds.

Within school 40, both emotional control and empathy negatively predicted student referrals, with a one-unit increase in emotional control and empathy resulting in a 52% and 49% decrease in the likelihood of being referred, respectively. Gender was the

only other significant predictor of referrals, with males facing greater odds of being referred than females.